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29

WAYS TO SURVIVE A
LIGHTNING STORM *p64*

↑
TIARA
44 COUPE
A GEM
OF A RIDE

POLK'S
NEW APP
TAMES
MARINE AUDIO *p82*

CERTIFIED BOAT TESTS

TIARA 44 COUPE WELLCRAFT 35 SCARAB OFFSHORE TOURNAMENT

ROBALO R300 CAROLINA CAT 23SD

CONTENDER 22 SPORT SEA CHASER 22 HFC

Crown Jewel
HOLLAND, MI

HOW TO
CRUISE WITH
YOUR DOG *p42*



TEST YOUR
NAVAID SKILL *p16*

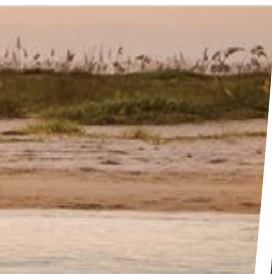


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The 24SD comes from a full line of hand-crafted Cobalt models, one of which is precisely matched to your wishes.



82

Departments

14 Making Waves

- Preventing the next Titanic
- We compare throwable PFDs.
- Know your aids to navigation.
- Infamous last words of boaters
- The app that finds you a slip

28 The Boat Doctor

- Mick Hannock solves all your problems in 200 words or less.
- The latest on the Coast Guard
- Install EVA foam nonskid.
- Protect your pooch.
- Mount your EPIRB.

62 Motorhead

- Fuel leak? Here are 10 steps to take to fix it.

82 Electronics

- Polk Ultramarine audio system
- Cases for your smartphones
- Can you stream music? Ask Ken.

84 Short Casts

- Stay safe out there.
- Mind your feet.
- Garmin's Panoptix sonar

86 BoatingLAB

- Important data on the best PLB, the device that can save your life

FEATURES

64 KA-BOOM!

Check out these 29 strategies for surviving lightning strikes.

BY MIKE TELLERIA

70 Spin Doctors

Does computer propeller repair make boats run better?

BY CAPT. VINCENT DANIELLO

76 Going the Distance

Designing a boat that can go 100 mph burning 2 mpg, to break records

BY ERIC COLBY

→ Tests



Tiara

44 Coupe

With top-notch construction, this entertaining cruiser proves there's no such thing as overbuilt. **p. 46**



Contender

22 Sport

An offshore carving knife of a center-console that you can still haul to the ramp on a trailer. **p. 50**

ALSO:

► **CAROLINA CAT**
23SD
p. 54

► **SEA CHASER**
22 HFC
p. 56

► **WELLCRAFT**
35 SCARAB OFFSHORE
TOURNAMENT
p. 58

► **ROBALO**
R300
p. 60

Columns

12 Editorial

Hulls or engines: Who's pulling whom here?

26 Seamanship

Watching anchor after dark

106 Following Seas

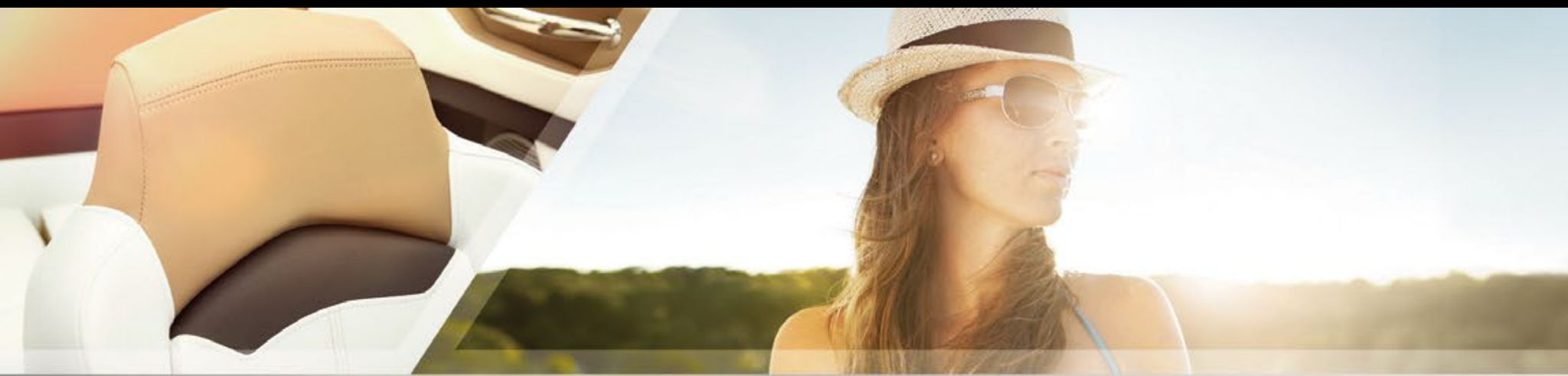
Outboards: Is bigger really better?



◀ ON THE COVER

The Tiara 44 Coupe has a sociable layout and a smooth ride in rugged seas. Photo: Billy Black

PHOTOS: (CLOCKWISE FROM TOP LEFT) CAPT. VINCENT DANIELLO, COURTESY POLK AUDIO, COURTESY CONTENDER BOATS, BILLY BLACK



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Editorial

By Kevin Falvey



The Cart Before the Horsepower

PROPULSION AND ITS EFFECT ON BOAT DESIGN

BACK IN THE EARLY DAYS OF planing powerboats, builders mounted engines forward in the boat, oftentimes way up in the bow. Of course, this is exactly backward, since a planing boat performs best with the weight aft of amidships. Nonetheless, many boaters will understand why this was done, having had the experience of running, or riding in, an underpowered boat that required the weight of crew or gear located forward in order to bring the bow down.

Those early planing powerboats were not necessarily underpowered. Instead, their hull forms had not yet caught up with the newfangled, lightweight engines that became available in the late 1940s following World War II. Surplus engines by Allison, Hispano-Suiza, Liberty, Merlin and others caused designers and builders to broaden transoms, straighten buttock lines and lighten scantlings. Developments in engines — pardon me — drove developments in boat design.

Time-travel to today, and one can watch the opposite occurring. Outboard engines are all the rage, delivering gobs of power in a lightweight, low-drag, corrosion-resistant form. It's significant that one would be hard-pressed to install a power plant any farther aft than an outboard engine. The world's largest outboard, the Seven Marine 627, debuted in 2015, and Evinrude, Mercury, Suzuki and Yamaha all offer engines of at least 300 horsepower. One can see these engines, often three and four at a time, gracing the transoms of big center-console boats, the so-called "super consoles."

But are these big, new engines pushing the boat designs as they did in the early days, or are the boat designs dragging the engine makers to ever more stratospheric heights of horsepower output?

I think it's the boats pulling the engines rather than the engines pushing the boats. The planing hull form is near the top of

◀ **Are these big, new engines** pushing the boat designs as they did in the early days, or are the boat designs dragging the engine makers to ever more stratospheric heights of horsepower output?

its evolutionary cycle. The stepped hull, first conceived and implemented about a century ago, is now reaching the apex of its refinement. Composites advances mean lighter boats that are stiffer and stronger. These achievements mean boats that can handle more power while remaining in contact with the water and delivering a type of ride, handling, durability and control that experienced boaters would have scoffed at just 10 years ago.

Maybe even five.

Things aren't changing, folks. They've changed.

A handwritten signature in black ink that reads "Kevin Falvey".

Kevin Falvey, Editor-in-Chief
editor@boatingmag.com

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Making Waves

ON BOARD WITH ...

Cmdr. Gabrielle McGrath International Ice Patrol

The next time you're cruising the North Atlantic and don't slam into an iceberg, thank the International Ice Patrol, part of the United States Coast Guard. For more than 100 years it's been broadcasting iceberg warnings to anyone who listens. We spoke to Cmdr. Gabrielle McGrath to understand how it works.

— Phil Scott

TAP
HERE

To read the full interview online, tap here or go to boatingmag.com/icepatrol.



What can you tell me about the sinking of the *Titanic*?

Obviously the sinking of the *Titanic* in 1912 was a terrible tragedy: 1,500 people died after the ship hit an iceberg. It was the incident that created our unit. In 1912 and 1913, two Navy vessels patrolled the area near the Grand Banks of Newfoundland, and then during World War I the Coast Guard picked it up. Today, we collaborate with the Canadian Ice Service.

What do you do?

We monitor the iceberg range and the iceberg limit. We compute information

from anywhere we can get it — Coast Guard aircraft patrolling Newfoundland's Grand Banks, commercial reconnaissance, the Canadian Ice Service — and compile the data into one product that we send out to ships.

Internet or Morse Code?

It depends on the capability of the ship. Some have access to the Internet; some print out a fax; some [get information by] radio. Or they monitor our website or the National Weather Service website. Our product is available to any international vessel, from commercial ships to small fishing boats.

Why concentrate on the North Atlantic Ocean? Won't Antarctica grow jealous?

It's the only location in the world where we have an intersection of shipping lanes with icebergs. Greenland's Labrador Current takes icebergs north first and then to the south, where they cross the Great Circle route. In addition, the cold Labrador Current intersects with the warm Gulf Stream current, which creates fog in the summer and storms in the winter. With those two pressure systems we'll see 30- to 60-foot waves. It's very dangerous. There's

sea ice as well, depending on the season. The sea ice often freezes around the iceberg, and when it's encapsulated in sea ice, it's not exposed to the warming elements and it's able to drift much farther south.

How large is the area you cover?

500,000 square miles.

Since you've been in business, has there been another *Titanic*?

We have a perfect safety record since the *Titanic*. But there have been collisions with vessels that have not monitored our product.

PHOTO: COURTESY UNITED STATES COAST GUARD

LOOKING FORWARD TO SUMMER

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Captain's Test

Aids to Navigation

Navigation aids are some of the most important things you'll see and hear on the water. Do you know what they're telling you? Take this quiz to find out. – *Eric Colby* (Answers on p. 20)

1 Which of the following are aids to navigation?

- A. Buoys
- B. Day beacons
- C. Lightships
- D. All of the above

2 Is a lighthouse or a light on a piling considered a beacon?

- A. Lighthouse
- B. Light on a piling
- C. Both
- D. Neither

3 A lighted beacon is called a light. What is an unlighted beacon called?

- A. A day beacon
- B. A day signal
- C. A buoy

D. A daymark

4 A beacon is equipped with daymarks that have what distinctive features for daylight identification by mariners on the water?

- A. Shape and light
- B. Shape and color
- C. Light and color
- D. Shape and color of light

5 A pair of lighted or unlighted fixed navigation aids that show a skipper to be steering his vessel on the centerline of a channel are called what?

- A. A pair
- B. A duo
- C. A lineup
- D. A range



PHOTO: SHUTTERSTOCK

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– Len Rorke



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Making Waves

→ FOR COMPARISON'S SAKE

Throwable Personal Flotation Devices

A Type IV personal flotation device (PFD) is one of the most underrated pieces of safety equipment on your boat. It's often the first accessory deployed in a man-overboard situation, so take a look at these three choices. — *Eric Colby*



Stearns Flotation Cushion

THE FLOAT: More than a comfortable cushion to sit on during a cruise, the Stearns flotation cushion measures 16½ by 14 inches and can provide valuable supplemental flotation during a man-overboard situation until help arrives. The cushion's shell is made of 200-denier nylon, and it has an Aquafoam PVC foam core.

THE SINK: It may not float all adults on its own, and a larger person might not be able to get his or her arms through the straps to be able to hold it in a hugging position.

\$17.99; stearnsflotation.com



Cal June Type IV Horseshoe

THE FLOAT: A more serious lifesaving device than a flotation cushion, the horseshoe is designed to be secured to a boat's rail so it can quickly be thrown to a victim in the water. The regular horseshoe from Cal June has 50 pounds of buoyancy and is made with closed-cell foam wrapped in a vinyl-coated fabric for durability.

THE SINK: It's the most expensive Type IV on the market, and you can't use it for anything else, such as a cushion. Also, you need to buy a mounting bracket for it.

\$119.99; jimbuoy.com



Cal June Throwable Life Ring

THE FLOAT: An adult can probably throw this device farther than the other two because of its rigid design and circular, Frisbee-like shape. The urethane foam core is wrapped in vinyl-coated nylon, and the ring has webbing straps so the person in the water has something to grasp. The grab line passes through the webbing. It provides 19 pounds of buoyancy.

THE SINK: It's hard, so you don't want to try using it as a cushion, and it could actually hurt if you hit a person with it when you throw it.

\$67.99 for the 19-inch diameter; jimbuoy.com

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Think you can build a better boat propeller? There's a contest for that. At the Build a Propeller Race in Fort Lauderdale, Florida, participants were given thin copper square blanks and a few tools. The contestants, ranging from middle-school kids to marine industry professionals, built propellers for 24-inch-long radio-controlled boats and then raced them in tracks made from rain gutters.

"We had 10-year-old kids racing against — and sometimes beating — naval architects," says Jimmie Harrison, a past president of the National Marine Propeller Association. This year's race was combined with the Plywood Regatta (plywoodregatta.com) coordinated by the Marine Industries Association of South Florida in April in Dania Beach, Florida. Sponsors included 3M, MarineMax and Neptune Boat



Tap here for more about designing and racing your own propeller, or visit boatingmag.com/design-propeller

Lifts, with proceeds going toward college scholarships for local kids pursuing marine-trade-related degrees. — *Capt. Vincent Daniello*



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Treats for Feet

Before there was neoprene or Capilene or synthetic fleece, the original rugged outdoor fabric of choice was wool. Yes, sheep fuzz is making a comeback in performance wear, as outdoor types turn to products made with merino wool, like these great Farm to Feet socks that are 100 percent made in the USA.

Farm to Feet sent me a pair of its Concord fish sporting socks over the winter, and they instantly became a go-to pair. They are made of a blend of 71 percent merino wool, 28 percent nylon and 1 percent spandex. These medium weight socks served me well on a lot of expeditions in cooler temperatures, both on the water and in snow. The wool naturally wicks away moisture — I've read in other places it can absorb over one-third of its weight in water — and also has bacteria-resistant properties that help eliminate odor. The toe and heel are reinforced and the toe is seamless, so there's no bulky bunching up around your toes.

I have to admit that I was sold on the leaping trout design on these socks before I ever tried them on, but they still met my expectations for keeping my feet warm and dry. Farm to Feet has a range of socks from low cut to full calf, and lightweight to heavy duty. All the socks are guaranteed for life. \$23; farmtofeet.com — *Pete McDonald*

PHOTOS: (FROM TOP) COURTESY NATIONAL MARINE PROPELLER ASSOCIATION, COURTESY FARM TO FEET



► Captain's Test

(ANSWERS FROM P. 16)

- 1 D. And that's not the full list.
- 2 C.
- 3 A.
- 4 B.
- 5 D.

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THEIR LIFE AND SAYS,
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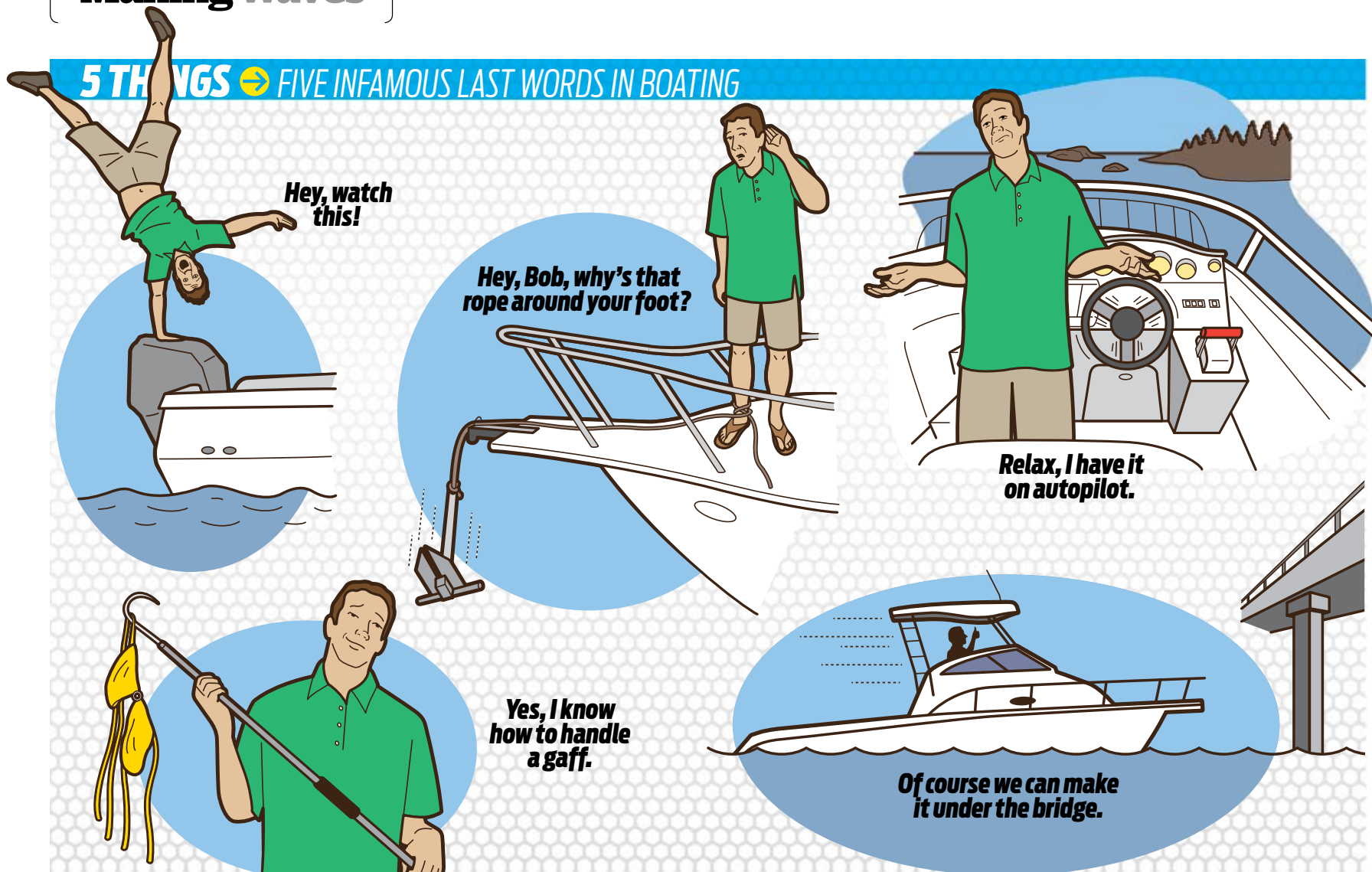
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Online This Month

May is safety and seamanship month here at *Boating*, so we want to provide as much information as possible about staying safe on the water. ① Lucky for you, we have a whole section of our website dedicated to boating safety. Visit boatingmag.com/boating-safety. ② Be sure to check out all of the safety videos we filmed in conjunction with the United States Coast Guard at boatingmag.com/safety-videos. ③ Don't forget to take our safety quiz to find out whether or not you're really a safe boater. Go to boatingmag.com/safety-quiz.

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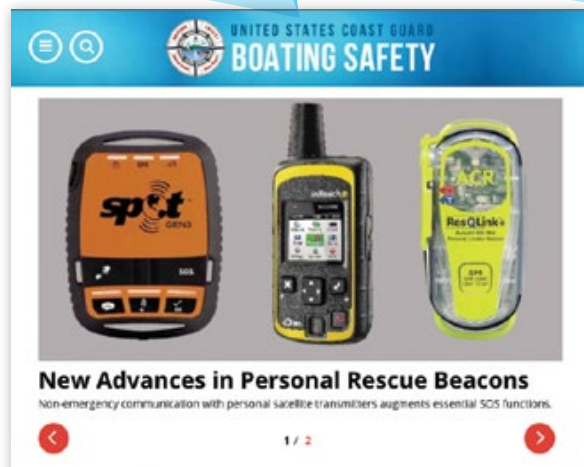
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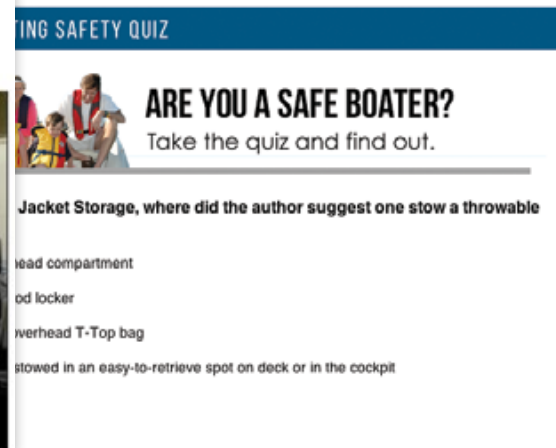
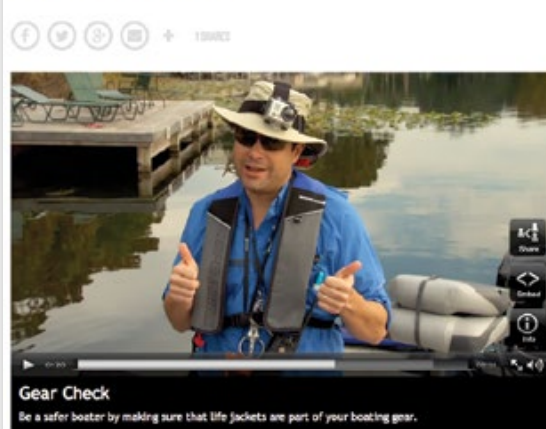
BOATING SAFETY QUIZ

Take our monthly boating safety quiz and you'll be entered to win a handful of great prizes! We're giving away a \$1,000 West Marine gift card at the end of December, as well as a \$250 West Marine gift card every month! Contestants may enter as many times as they like during year. The winner of the monthly \$250 gift card will be selected on a monthly basis at random. The grand prize winner of the \$1,000 West Marine gift card will be selected from all participants of the monthly quizzes at the end of 2015.

To see the full rules [click here](#).



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Seamanship

By Jim Hendricks



Night Shift

TAKING TURNS ON ANCHOR WATCH IN THE DARK

RULES FOR THE FISHING TOURNAMENT AT CATALINA ISLAND off the coast of Southern California allowed us to fish all night, so our team decided to anchor in a potentially productive, albeit lumpy, cove on the breezy, wave-swept backside of the island.

We weren't alone. Several other boats anchored close by, two within 50 feet of us. So we decided that each member of our four-man crew would take turns standing watch and checking fishing lines while others snoozed.

I rolled out for my rotation at 4 a.m., and about a half-hour later I noticed that the boat anchored to port was sliding into our port quarter. Its anchor was dragging and the crew had failed to post a watch. I fired up the mains and nudged us out of harm's way. That woke up everyone, including the crew on the "slider," who hustled out to get underway and reset the anchor.

Standing watch might sound easy, but try staying awake and alert to potential dangers all night on the hook. Unless there are fish biting, you'll eventually

for Preventing Collisions at Sea (Colregs) Rule 5 (known as the Lookout Rule) states: "Every vessel shall at all times maintain a proper lookout by sight and hearing as well by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision."

Also, given that the person who stands watch will be alone on deck, he should be wearing a Coast Guard-approved life jacket as well as a personal locator beacon (PLB).

I'll admit to having left the deck unattended in a quiet, secluded anchorage. Yet I make it a practice to get up every hour, scan the surroundings, check our angle on the rode and



might drag or the rode could break. A sudden storm might threaten the crew's safety.

The Coast Guard recognizes that not every vessel maintains a lookout while at anchor, but

also admonishes skippers and crews who sleep through the night.

"This practice is dangerous, as well as being a violation of basic seamanship law," the Coast Guard states in a news release directed at Alaskan commercial fishermen. Citations for violations of Rule 5 range upward to \$6,500.

Relying solely on radar guard-zone alarms or GPS anchor-watch alarms is not sufficient, says the Coast Guard, though this equipment should still be used to augment your lookout measures.

While it's the captain's ultimate responsibility to maintain an anchor watch, the best procedure is to rotate lookout responsibilities. It helps to have a four-man crew, but it can also work with as few as two aboard. In any case, two-hour shifts keep each man alert throughout his watch. To stay awake, set your mobile phone or digital wristwatch to sound an alarm at 15-minute increments.

Crew members also need to respond ably in an emergency, so make sure everyone knows how to start the engine(s), maneuver the boat and retrieve the anchor line. The lookout should call all hands on deck as soon as he senses impending danger.

No one likes to get roused out of a warm bunk to stand lookout, but rotating the anchor watch shares the burden and helps ensure the safety of the crew, while also allowing everyone to rest knowing that there's someone awake on deck. Besides, it's the law.



fall asleep, at least momentarily. I know. I've been there.

There is a solution, but first let's talk about the importance of a lookout if you plan on anchoring for the evening. Posting an anchor watch is not only prudent; it's required by law.

The International Regulations

make sure the anchor isn't dragging.

However, in anchorages subject to boat traffic or where other boats are anchored, it's a different story. This calls for posting an anchor watch at all times. Other boats are not the only threats. Your own anchor

QUICK TIP

Suggested overnighting scope on the anchor is 7:1, but less can work depending upon room to swing.



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The Boat Doctor

Q&A

By Michael “Mick” Hannock



ASK THE MASSES Go to boatingmag.com/forums to ask fellow boaters your questions, or to answer theirs.

Plane Slow

[Q] I have a 21-foot walkaround cuddy with a 150 hp Yamaha outboard for power. I have trim tabs and a four-blade propeller. Would adding a planing fin, like the Doel-Fin, help my boat get on plane faster? The tabs help, but a fin might help too.

TOM MITCHELL

Via email

[A] Hey, Tom. A hydrofoil can help get you on plane, but often at the expense of slower speed and less efficiency. You can see this by watching the engine rpm versus GPS speed now, and then recording these numbers again following installation of the foil. Chances are good you'll be turning higher rpm (burning more fuel) with the hydrofoil to make the same speed.

That said, we should back up. What rpm is your engine making now? And what prop (diameter and pitch) are you running? A lower pitch may help, if you can spin it without revving too high.

In the end, 150 hp is adequate but not “plenty” of power for a 21-foot cabin boat like yours.

Get me your prop specs.

Plane Slow, Part Two

[Q] Thanks, Boat Doc. I'm running around 5,400 to 5,600 rpm, maybe 32 to 35 mph. I switched to a four-blade stainless-steel prop. The boat came with a three-blade 15-by-15-inch prop, and the engine could get to only around 4,800 rpm. I bought a three-blade stainless-steel prop that was a 15-by-13-inch to get my rpm up to around 5,400, but getting up on plane was slow. I found a four-blade prop and I think the pitch was 15 inches, but it was the lowest pitch that I could get in a prop having four blades. I had lost 1 to 2 mph on the top end, but getting up on plane improved. The top end isn't critical because the speed limit on the Intracoastal Waterway is 25 mph.

Before I throw more money at a motor or



Here's a tip you can use to end the soaked phone blues. In fact, the tip will help you protect your keys, cash or whatever.

All you need is a freezer-size zipper bag and a tennis ball.

Place the item in the bag with the tennis ball. Seal the zipper.

Done. Need more flotation?

Trap some air in the bag before you seal it. Or you can

add another tennis ball. You can even add a

light stick for nighttime use.

— *Kevin Falvey*

new rig, the prop is a cheap way to go.

Thanks for the feedback.

TOM MITCHELL

Via email

[A] I would try more diameter, same 15-inch pitch, and stick with four blades. This will help get and hold the boat up. Yamaha's four-blade props, the Performance 4 series, are 13¾-inch diameter and come down to 18-inch pitch; the other Yamaha four-blade wheel is the High Seas. These are 15-inch diameter (good!) but the lowest pitch is 21 (maybe not so good for you).

Mercury offers the Revolution 4 in 14-by-15-inch — that might be the ticket.

Do you have a prop shop or marina you can work with so you can try a few different props? That helps. Demo props cost nothing — a new Rev 4 will run you about \$450.



A Little Bet

[Q] Boat Doc, my friend and I have a little bet. I cruise my Cobalt powered by a five-liter MerCruiser between 3,300 and

PHOTO: COURTESY MERCURY MARINE



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The Boat Doctor

4,000 rpm. However, in my truck, I am hard-pressed to hit 3,000 rpm. Thus, the bet: I believe the valves, cams, pistons and other inner workings are so different in a marine engine compared with an automotive engine that that is what results in the rpm difference between the two. My friend believes otherwise.

The person deemed incorrect must supply the fixings for a Louisiana crawfish boil this spring. (Notice, I didn't write "loser" since we all get to

enjoy Louisiana crawfish!)

DONALD KING

Baton Rouge, Louisiana

[A] The short and sweet as pepper jam answer is that your truck has a multispeed transmission while your boat has just one forward gear. As your truck's engine speed — the rpm — increases, its transmission shifts gears, reducing engine speed. A tranny works well with wheels but is more difficult to dial in with propellers (though it

can be made to work using variable pitch props and accepting certain very narrow performance limitations).

Pass the hush puppies!

(WE TEST STUFF)

Sta-Bil 360 Marine

The full name is a mouthful: Sta-Bil 360 Marine Ethanol Fuel Treatment and Stabilizer. I added it to my E10 gasoline just prior to winter layup. Come spring, my engine started right up and ran fine, and after four months, no water has shown up in the fuel filter collection bowl.

Confident performance is what I'd expected, since I'd used Sta-Bil's regular Marine Formula in the past with good results. Sta-Bil 360 Marine differs from that original formula in that it also releases a corrosion-blocking vapor that is said to preserve fuel system components — even those not covered by fuel.

Add one ounce of Sta-Bil 360 Marine Ethanol Fuel Treatment to every 10 gallons of fuel at every fill-up; mix one ounce into five gallons for long-term storage.

It's available in 12-ounce (\$24.99) and 40-ounce (\$49.99) bottles at cabelas.com. — K.F.



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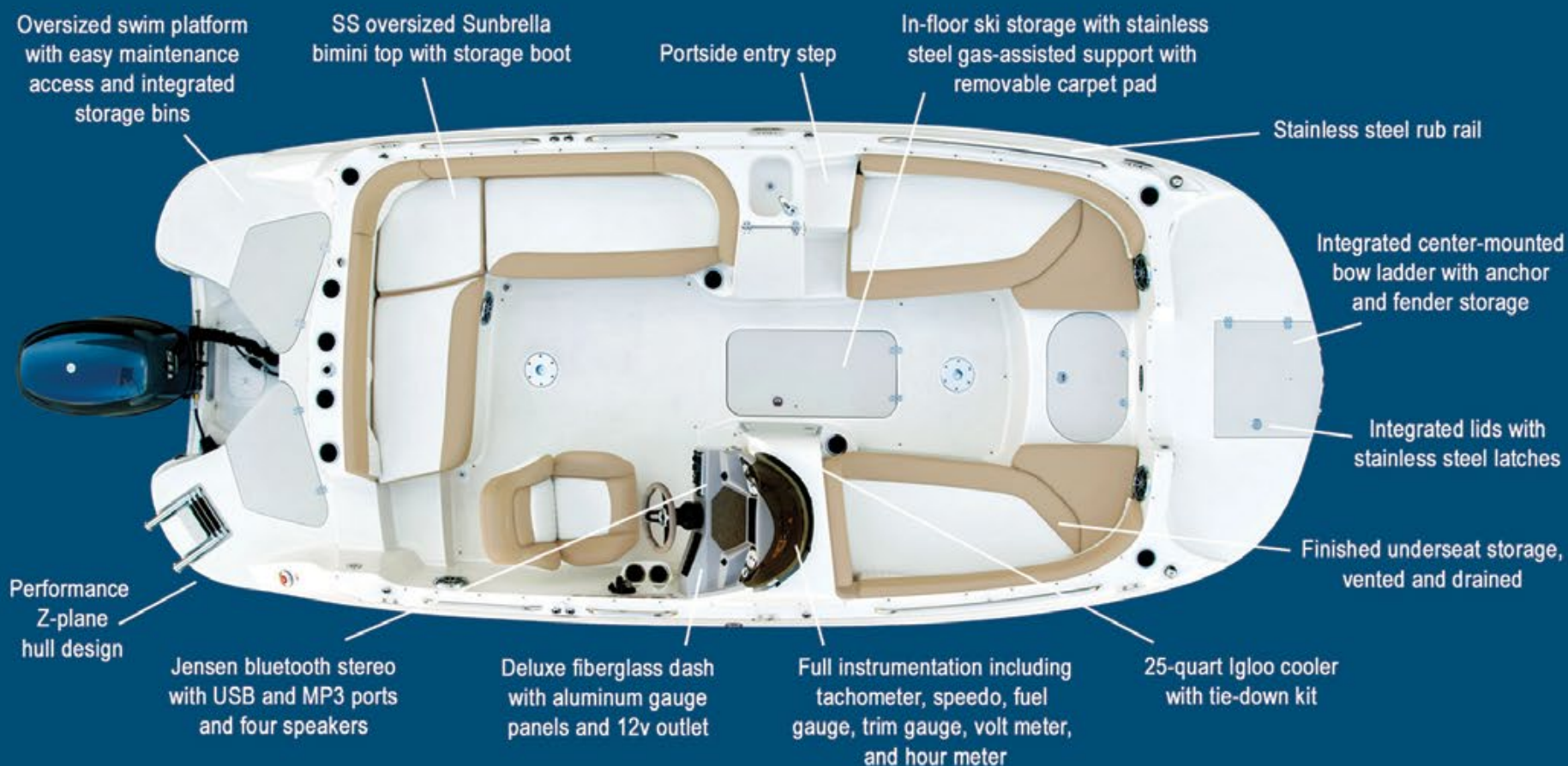
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Step What?

[Q] Mick, in Volume 88 of *Boating* you answered a nonslip boarding problem and referenced and showed a picture of a Perko nonslip pad. It looks cool but I wore out my stylus Googling the Perko pad! Where can I get one?!

E. GREG GILBERT
Via email

[A] Mr. Gilbert, here is the page URL in the Perko catalog online showing several step pads with model numbers: perko.com/product_listing_alpha/deck_hardware/5/110/.

I am sure West Marine, or almost any marine supply, really, could order it for you.

All the best, Mick.

Trying Tri-Toon

[Q] Doc, I have a 22-foot tri-toon pontoon powered by a sterndrive. I am retired, loving every minute of it, and trailer my boat to the Ohio River two to three times per week. The trailer's bunks are now six years old and need

to be replaced. I plan to use treated wood and stainless-steel lag bolts to make and fasten the new bunks.

SAM SCOTT
Louisville, Kentucky

[A] Hi, Sam. I am envious. While I am on the water at least three times per week myself, it is often for work.

As to your plan, it sounds like a good one, though I wish you

(WE TEST STUFF)

Taylor Made Scotchlite SOLAS Stickers

Conforming to the standards of the International Convention for the Safety of Life at Sea (SOLAS), and in turn approved by the International Maritime Organization (IMO) as well as the United States Coast Guard, these Scotchlite stickers were applied to my kids' life jackets. After a season of three and four days a week being alternately



wet and sun-baked, they are still adhering tenaciously to the fabric and still reflecting light blindingly. I heartily recommend this boating safety product. Great for kayaks, dinghies and other gear too. Packaged as 12 2-by-4-inch stickers for \$34.99; westmarine.com — K.F.

PHOTO: COURTESY WEST MARINE

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The Boat Doctor

had written about the trailer's construction. If it's aluminum, stainless steel makes the most sense. But if the trailer is galvanized or painted steel, I would save a few dollars and use galvanized fasteners. You might also consider a product like plastic bunk covers from Load Rite Trailers (loadrite.com). Unlike carpet, these won't hold the moisture between hull and bunk that causes rot.

Windy Woes

[Q] Mick, I had some problems recently trying to seal electrical connections I was making while the boat was in the water. It was a windy day, and I could not control the flame from my lighter nor keep it lit long enough to properly seal the heat-shrink electrical connectors. Finally, one of the yard mechanics lent me a heat gun, which worked great. Now



my question: If it's too windy for flame, and I am at a dock with no electricity, how would I seal the electrical connections against moisture and corrosion?

TOM MCALLISTER

Baltimore, Maryland

[A] A liquid vinyl product, such as Star brite Liquid Electrical Tape, seals connections against the elements, can be applied in windy conditions and requires no connection to shore power or another electrical source. I use flame, heat gun, shrink connectors and liquid vinyl — sometimes separately and often in combination. What's "best" often depends upon the specifics of the scenario, and it pays to be prepared.

Water Colors

[Q] Can you recommend a water-based anti-fouling paint?

JOHN SEIMENS

Portland, Oregon

[A] I have used Pettit Hydrocoat with good success. You can also read about editor-in-chief Kevin Falvey's experience at boating.mg/antifoulingtest. But that was for his boat, in his location, with his usage rate and for the duration of his season. All of these variables affect which is the best anti-fouling coating for you. Contact Pettit (pettitpaint.com) or another manufacturer and speak to its tech staff. Or ask what

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NAUTICAL NO-NO

Pumps with the Wrong Wire

You might expect a pump designed for a boat to have tinned wires to resist corrosion or some indication on the insulation that the wire is marine grade.

Yet the wires on this marine diaphragm waste pump are not tinned, and there is no labeling that indicates that the insulation meets American Boat and Yacht Council (ABYC) or Underwriters Laboratories (UL) standards for marine applications.

UL standards call for tinned wire, but the ABYC guidelines do not, though it has standards for wire insulation. Yet some ABYC members believe that tinned wire is a good idea.

Bob Adriance, a member of the ABYC Technical Board and blogger for the ABYC website (abycinc.org), writes: "Marine-grade boat cable can be tin-plated for corrosion resistance and

though the [ABYC] standards are silent on this issue, in my opinion should be the only type of wire used on a boat."

We agree, and suggest you look for wire that meets UL standards for marine applications on any accessory you plan to install. – *Jim Hendricks*



PHOTOS: (FROM LEFT) COURTESY PETTIT PAINT, JIM HENDRICKS

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2015 State of the Coast Guard

NO MORE DOING
“MORE WITH LESS”

IN HIS STATE OF THE COAST GUARD address, Adm. Paul Zukunft referenced the humble beginnings of this United States military branch and praised the 88,000 men and women currently on active duty, reserve, civilian and auxiliary status. He made special mention of several officers, including rescue swimmer Corey Fix, who saved 13 lives in a single event in 2013 off the rocky shores of Northern California.

The bulk of the commandant's address, however, focused on budgetary issues.

Zukunft railed at the Coast Guard's loss of 40 percent of its acquisition budget in the past four years. He decried the amount of debt that must be serviced, calling it akin to paying the minimum due on a credit card bill.

Referencing a predecessor's statement comparing Coast Guard readiness to a dull knife, Zukunft stated, “While the knife is not yet dull, we are cutting at a furious pace with no whetstone to sharpen the edge.”

Zukunft stated his intention to make these issues a priority, insisting that the Coast Guard will “not do more with less.”

The admiral also outlined the challenges and duties of today's Coast Guard, stating that specific goals included additional successful illegal drug interdictions, increased efforts to combat criminal networks, the securing of our

borders more effectively, and investment in new equipment such as an affordable offshore patrol cutter. Zukunft was clear regarding the Coast Guard's role as a protector of maritime commerce activities, mentioning specifically the American Energy Renaissance Act and the huge increase in oil and natural gas transits.

Zukunft also proposed investments in ice-breaking cutters (“Russia has a fleet of 27. We have two.”), the soon-to-be-signed Coast Guard Cyber Strategy in coordination with the Department of Homeland Security, and improvements to navigation aids and waterways management.

Additionally, Zukunft outlined his human capital plan, calling it a work in progress that will include “guiding principles



to enable our human resource directorate to build an adaptive, specialized and diverse 21st-century workforce.”

Perhaps most compelling were Zukunft's closing remarks decrying any sexual assault within his service's ranks, demanding that Coast Guardsmen reject tolerance of this activity by “reinforcing a culture that is inhospitable to it, and the behaviors that enable it.” — *John Tiger Jr.*

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Installing EVA Foam Nonskid

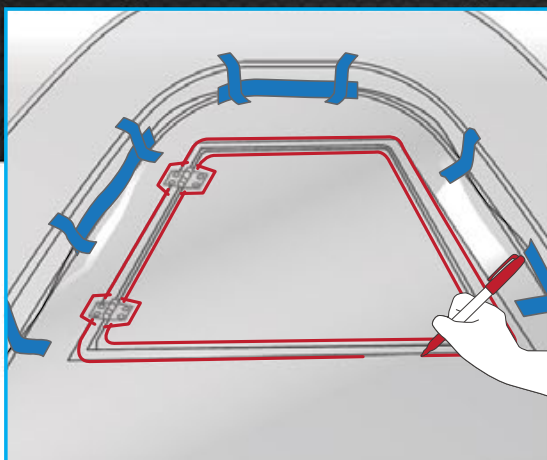
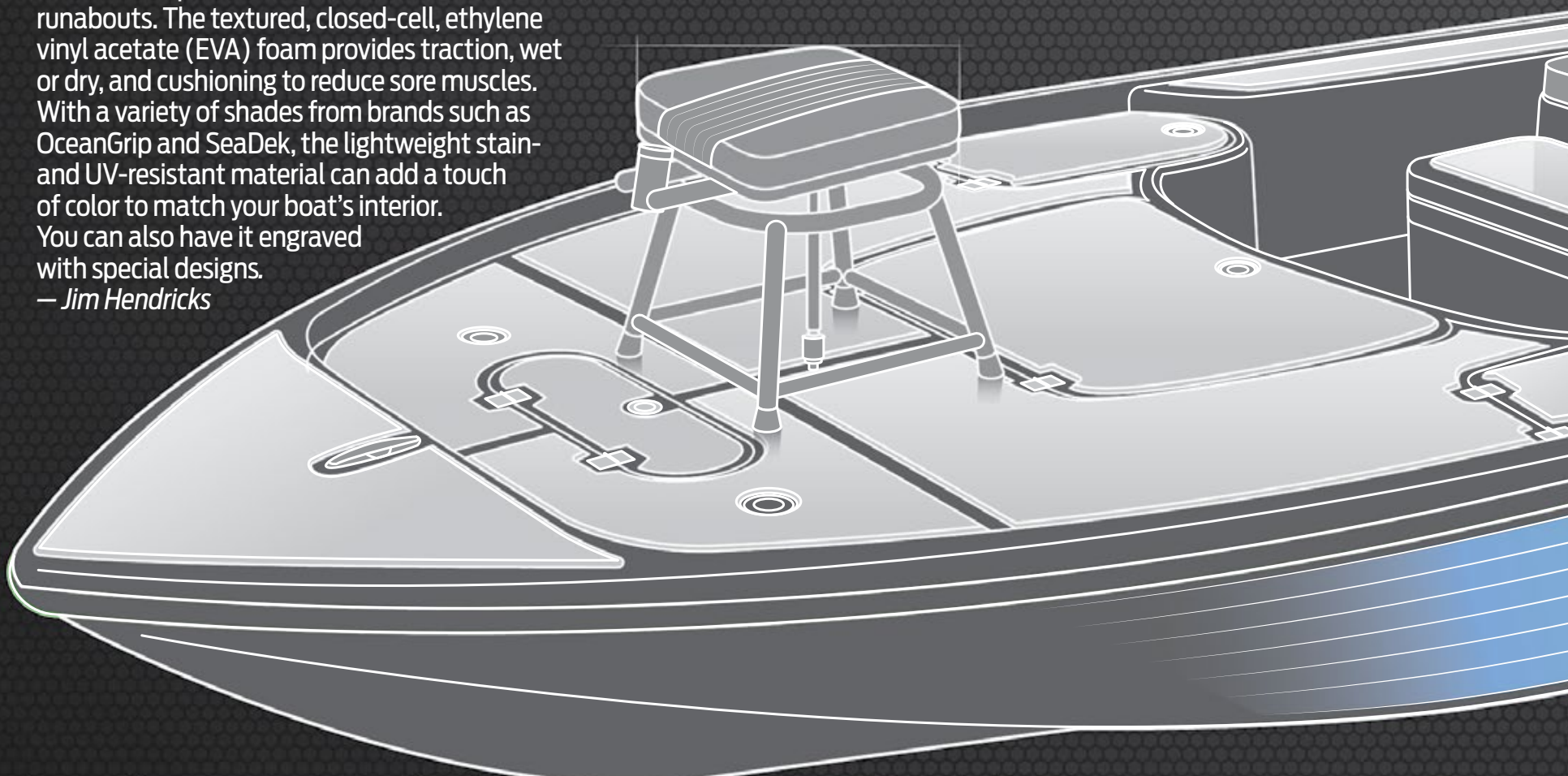
ADD A NONSKID SOLE WITH CUSHION, COLOR AND GRAPHICS

EVA foam nonskid decks are increasingly popular on flats skiffs and bay boats, as well as on the swim platforms of wakeboard boats and runabouts. The textured, closed-cell, ethylene vinyl acetate (EVA) foam provides traction, wet or dry, and cushioning to reduce sore muscles. With a variety of shades from brands such as OceanGrip and SeaDek, the lightweight stain- and UV-resistant material can add a touch of color to match your boat's interior. You can also have it engraved with special designs.

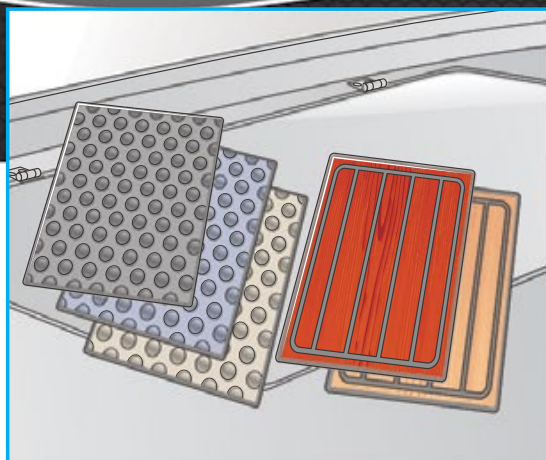
— Jim Hendricks

QUICK TIP

There may be an existing pattern to fit your boat. SeaDek, for example, has more than 1,000 pre-measured patterns. Specify the boat model, colors, texture and graphics, and the nonskid deck is custom-made without need for a stencil.



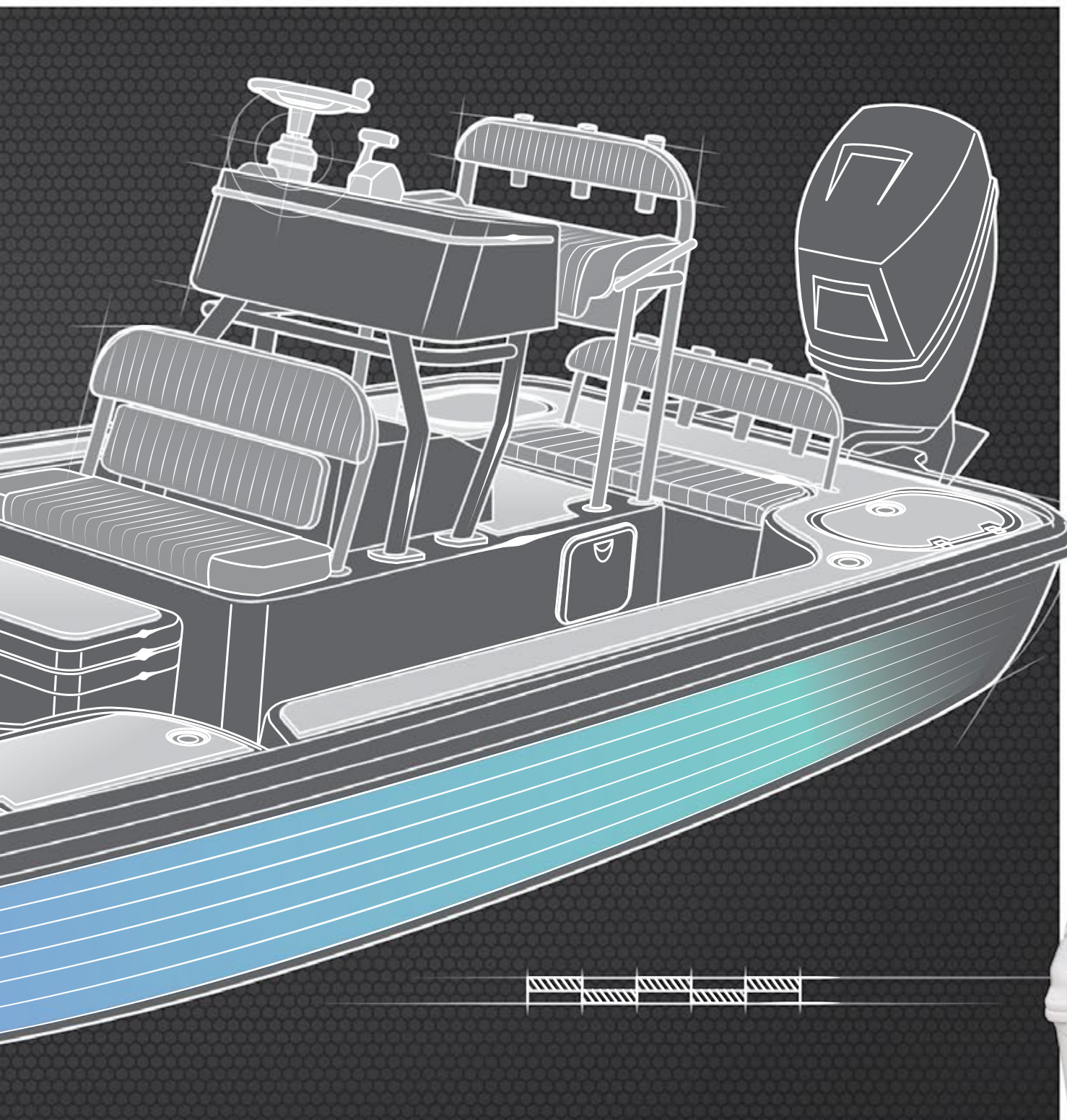
1 CREATE A PATTERN Start by ordering a stencil kit from the company you plan to work with — in this case, SeaDek. Costing \$15, the kit consists of clear Mylar plastic sheets, an indelible marker and instructions to create a pattern that you submit for a quote and (with your approval) production of your nonskid deck. SeaDek also offers an online video that takes you through the stencil making, as well as the installation process. The cost of the stencil kit is credited toward the purchase of your deck.



2 PICK THE TEXTURE AND COLORS Choose from two textures — embossed dots or brushed wood grain. The latter offers the classic look that some boat owners prefer. SeaDek offers 16 colors, with decks constructed from two laminated layers in contrasting colors, giving the deck an overall thickness of about ¼-inch. Beveled edges offer a classy look. The underlying color also allows routed caulk lines or custom graphics to stand out. Ask about graphics options when ordering your deck.



3 PREPARE THE DECK EVA foam nonskid can be installed on metal or fiberglass decks, even those with existing nonskid patterns, but the deck must be clean and free of grease, dust and other contaminants. Just before you install the nonskid, scrub the deck with a stiff-bristle brush and soap and water, rinse thoroughly, and then dry it with a towel to eliminate water spots. Finally, wipe down each section of the deck with denatured alcohol to ensure a clean mounting surface.



GETTING STARTED

SKILL LEVEL



TIME TO COMPLETE

8 HOURS

TOOLS AND SUPPLIES

- ▶ Stencil kit for creating a pattern (\$15; seadek.com)
- ▶ EVA foam nonskid deck kit (cost varies but averages about \$1,800 for an 18-foot flats skiff without graphics, according to SeaDek)
- ▶ Masking tape
- ▶ Denatured alcohol
- ▶ Clean rags and rubber gloves (for scrubbing with alcohol)



4 INSTALL THE NONSKID Peel-and-stick, pressure-sensitive adhesive backing from 3M makes installation easy and creates a strong bond. Position each section of nonskid and tape it in place. Then lift one corner slightly, peel away a bit of the backing, and lay the corner back down. Do this again to an adjacent corner. Now remove the positioning tape, lift the opposite side, slowly peel away the backing (beginning at the two corners you just laid down), and lay down the rest of the nonskid. Press firmly to fully activate the adhesive.

CLEANING EVA FOAM NONSKID

EVA foam resists stains, but lighter colors might look grimy after a while. A pressure washer (use a low-pressure setting to prevent damage to the foam) will restore the original color. Avoid using harsh chemicals such as acetone, alcohol or chlorine on the nonskid. Expect six to eight years of heavy-duty use. — J.H.



EVA FOAM ACCESSORIES

There are other ways to use EVA foam on your boat. For example, you can have coaming bolsters made to match your nonskid. SeaDek also offers smaller nonskid pads for areas such as the bridge deck, top of a console or even the lid of a cooler, which doubles as a platform or seat. — J.H.

10 Tips for Cruising with Canines

Nothing makes my pit bull Lacy's ears perk up like the question "Wanna go on the boat?" She loves it when the wind blows up her floppy ears and she gets a full snout of fresh air as we cruise across Sebago Lake in southern Maine. Prior to Lacy, whom I rescued from a shelter, I boated with Otis and Tucker. Here are 10 tips – some learned firsthand, others from various sources – that you can use when taking your pet for a cruise. – *Eric Colby*



Hydration

Bring plenty of water from a collapsible bowl such as this one from outwardhound.com (\$6.99 for a 48-ounce bowl).

Boarding

Consider a boarding ramp if your pet is too large to be carried under one arm. A ramp also makes it easier for a pet to reboard from the water, the beach or a sandbar.



Identification

Include a mobile number on your pet's tag. I prefer a tag that clips directly to the collar because it can't get caught on anything or scratch my boat. Consider having a microchip imbedded beneath the dog's skin. The chip is part of a registry and can be read by vets.

Acclimation

Keep your dog's first boat outing brief. My dog used to stop and assume a wide-footed stance on the dock. Get your dog comfortable on docks and boats.

Dog Overboard Plan

Create a game plan before you even bring your pet on a boat.

Life Jackets

Even "water breeds" benefit from a life jacket, especially in strong current or choppy water. The

handles on a life jacket also help to grip and lift a pet into the boat.

Leashes and Collars

A harness, as opposed to a collar, provides a means to grab and lift the dog, even using a boat hook.



First Aid

Make sure you have a stocked pet first-aid kit aboard like the one from RC Pet Products Ltd. (rcpets.com, \$35). The Humane Society of the United States

recommends pet-specific supplies and useful items to include in a boating dog's first-aid kit. Dogs can take Dramamine and other remedies for seasickness. Check with your vet.

Nature's Call

While many housebroken pets will be reluctant to "go" aboard your boat, pets can be trained to use carpet scraps, wee-wee pads or litter boxes placed in the cockpit.

Sunburn Protection

Sunscreen should be applied on the dog's belly and inside the hind legs, at least. Pet sunscreens like Doggles (doggles.com, \$16.99), Nutri-Vet (nutrivet.com, \$7.99) and Vet's Best sun relief spray (petnation.org, \$9.99) are free of zinc oxide, which can be harmful if pets lick it. Spray-on varieties are easy to apply.

WAG BOARDING STEPS

WaterDog Adventure Gear makes a variety of pet boarding steps for boating dogs including steps specific to certain boat types, such as models for pontoon boats, hunting boats and even docks and pools. Prices start at \$150; getwag.com — *E.C.*

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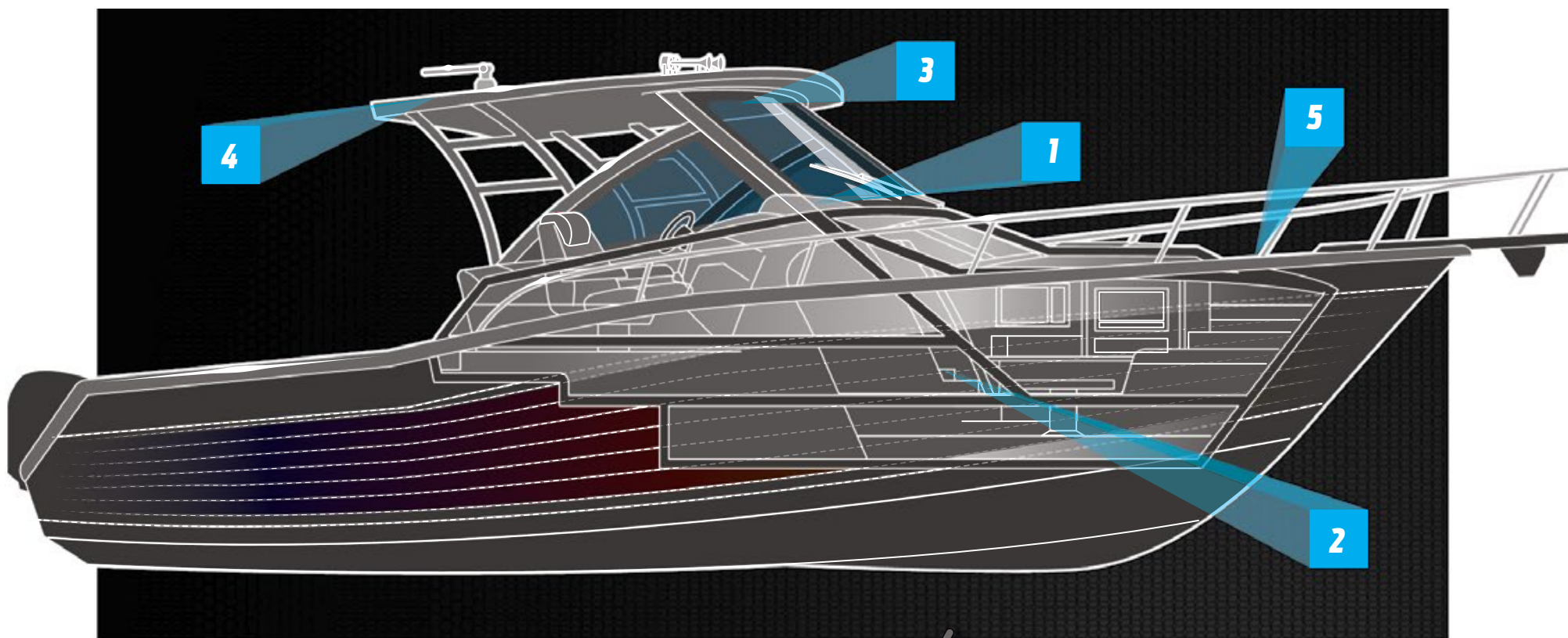
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WHAT TO LOOK FOR



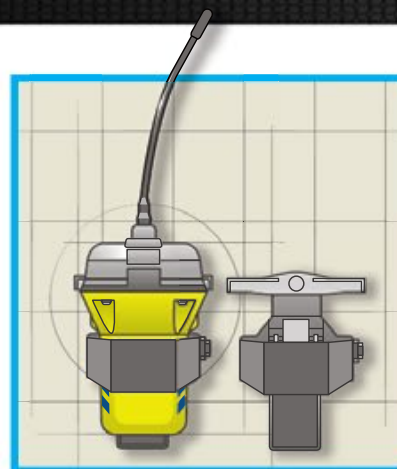
EPIRB Mounting Considerations

An EPIRB (emergency position-indicating radio beacon) is your lifeline to rescue. A bad day can get worse if that beacon burns or gets trapped inside your sinking or overturned boat. You might also have to activate it manually if you're adrift or you need medical help. While there are many aspects to EPIRB selection and operation, the mounting location is one detail that's critical. Consider these things whether having your EPIRB installed or installing it yourself. — *Capt. Vincent Daniello*

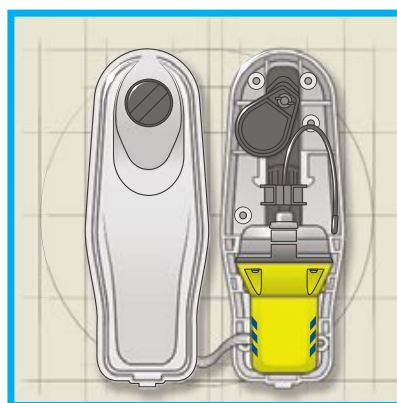
CATEGORY II brackets simply hold an EPIRB until it's manually retrieved. Mount it near the helm **1** or along the evacuation route from belowdecks **2** but not above sources of fire like the engine room or galley. Avoid prolonged direct sun and frequent saltwater dousing, and don't mount it where a swinging door might slam into the EPIRB or someone might

use it as a step or handhold. Good locations include the underside of a hardtop **3**, inside a door near the helm, just inside the companionway or near the ladder to the flying bridge.

CATEGORY I brackets automatically deploy the EPIRB they secure once they sink to between 4 feet and 13 feet underwater. They're designed to



CATEGORY II



CATEGORY I

withstand sun and sea. Boats often roll upside down before they sink, so avoid areas that might trap the beacon as it floats free. The best spot might be atop the hardtop **4** where it can be retrieved from the cockpit for manual activation. The foredeck **5** is good, but you may need to go forward in a sea to manually activate it, if required. In either case, mount it

near the centerline of the boat where the bracket sinks deeper if the boat rolls. If you remove your beacon to prevent theft, spend \$50 for an extra Category II bracket so it can't transmit if it gets wet.

Key Facts

⚡ MAGNETIC CARE

Keep Category I and Category II brackets at least 3 feet from a compass or strong stereo speakers since the brackets include a magnetic switch.

⚡ BEWARE RADAR

Don't mount EPIRBs in a radar's transmitting beam.

⚡ STAY IN PLACE

Remember: An EPIRB will transmit distress signals any time it is removed from its bracket *and* wet.

⚡ JUST IN CASE

Most EPIRBs go back to their maker every five years for a full test and a fresh battery. Replace auto-deploying hydrostatic triggers in Category I brackets every two years right aboard the boat. — *V.F.D.*

QUICK TIP

Consider a Category I bracket just for protection from the elements, even if your EPIRB must be mounted in a location that requires manual deployment.



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SWIPE IMAGE FOR GALLERY >>

Tiara 44 Coupe

I USUALLY CHUCKLE WHEN I HEAR THE TERM *overbuilt*. More often than not, what others think is overbuilt I think is good and rugged. Such was the case when I started poking around the nether regions of Tiara's new 44 Coupe. For example, some would call the support system for the bulkhead opening that allows the 44 Coupe's huge, extra-wide, sliding-glass salon doors overbuilt. I call it appropriate to last over the long haul. It features 4-by-6-inch vertical fiberglass beams running up the sides of the salon and across the top of the opening, as well as a large structure beneath the cockpit sole that spans the boat's beam. This is just a door opening, but indicative of Tiara's commitment.

From within the 44 Coupe's engine compartment, I admired large, reinforcing knees that ensure that the hull sides don't flex too much. Forward on each side, aluminum structural pillars fabricated on a heavy-duty sill along the windshield landing support the 44 Coupe's house structure and the large windows that give such a great view when you're cruising. Throughout the boat, the hinges for all the locker hatches have a great, heavy-duty feel. You know when you close a hatch it's not going to pop back open, which gives me a good feeling about how the boat is built overall. Tiara laid up the boat with a solid fiberglass bottom and balsa coring in the hull sides and deck.

Out on a lumpy Lake Michigan, my opinion of the Tiara 44

Coupe only improved. The boat is based on the same bottom as Tiara's 48 Convertible is, and the blue-water design knocked down waves with condescension and exhibited runaboutlike handling when I put it through a series of turns at about 25 mph. I drove it with the steering wheel and controls and then had even more fun, taking command with the joystick. It's nothing new, but sitting back and taking control of a 45-foot-6-inch vessel in the same way my 14-year-old plays a video game still makes me giggle.

From the time the manufacturer decided to come out with a complement to the 50 Coupe, Tiara remained dedicated to ensuring that the 44 Coupe exhibit the handling traits for which the manufacturer's boats are known. That even included moving the engine halves of the Volvo Penta IPS600 pod-drive systems farther forward and linking them to the pod drives with jack shafts. This is a practice employed by manufacturers of sport-fishing boats to improve cockpit space and center the weight of the engines for enhanced stability and an easier motion — but for more of an express-cruiser-style boat, this could have been risky. Moving the engines forward meant the manufacturer couldn't expand the size of the midcabin, which designers usually can do when working with IPS. I applaud them for wanting to ensure that the 44 Coupe rode and felt like previous Tiara yachts. My test boat topped off at a speedy 37.4 mph at 3,600 rpm and cruised comfortably at 26.3 mph

➔ **Tiara 44 Coupe**

SWIPE IMAGE FOR GALLERY >>

at 3,000 rpm. This performance is similar to what you can expect from boats like Cruisers Yachts’ 45 Cantius (\$955,350 powered like our test boat). Around the docks, the joystick made life easy, and so did the windows that ensured I could see everything I needed to while docking.

At the helm, the twin Volvo Penta Glass Cockpit screens provided all requisite information on engine health and navigation. I found it easy to use the integrated Garmin electronics, and the “yacht-wide” audio system impressed me with its zone-controlled volume, Bluetooth connectivity and two LCD TV screens, among other entertainment goodies. Controls are comfortably positioned, and the dash is finished

in a glare-killing dark upholstery. To port, there’s ample space for a crowd on the L-shaped lounge.

When you head belowdecks on the 44 Coupe, you’ll find some clever ideas that make the boat feel spacious. First is the hatch to the master stateroom that folds over twice to further open the area. There’s a queen berth with pillowtop innerspring mattress and abundant small-item stowage, and plenty of

natural light thanks to an overhead deck hatch and side ports. The private master head has a separate shower stall that’s impressive for a boat in this size range.

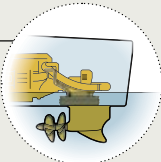
Ensconced in the master stateroom, you need not be disturbed. Crew can answer nature’s call in the day-head,

which is located at the bottom of the salon stairs. Work your way aft and the midcabin has twin berths that stretch from starboard to port and fill in with a cushion to accommodate two adults. This hanging locker is actually larger than the hanging locker found in the master stateroom because the optional combination washer/dryer installs here.

Back up in the salon, the galley is aft to starboard with an Isotherm refrigerator and freezer drawers and plenty of dry stowage. The cockpit has space that allows a crowd to hang out in open air, and I liked the steps built into the engine-compartment vents that facilitate side boarding. My favorite feature on the 44 Coupe, though, was the optional barbecue in the transom trunk (\$2,280). I can’t think of a better location for a grill than on the transom. Any spills are easy to clean up, and should the flames get out of control, there’s plenty of water. After all, you’re on a boat. And the hinges and hatch for the aft trunk are, of course, “overbuilt.” — *Eric Colby*



Tap here or visit boatingmag.com/2886 for more photos and an accommodation plan for the Tiara 44 Coupe.



AVAILABLE POWER:
TWIN POD DRIVES

High Points

- ▶ Having the salon and cockpit on the same level creates an excellent social flow.
- ▶ A double-wide sliding door for the master stateroom enhances below-decks space.
- ▶ Volvo Penta IPS joystick controls make the boat downright fun to drive.

Low Points

- ▶ Tiara traded the functional fiddle rails on the galley counters for cosmetically correct smooth edges, a substitution we bemoan.

▶ LOA: 45'6" ▶ Beam: 15'0" ▶ Draft (max): 3'8" ▶ Displacement (approx.): 30,000 lb.
▶ Transom Deadrise: 18 degrees ▶ Bridge Clearance: 10'0" ▶ Max Cabin Headroom: 6'5"
▶ Fuel Capacity: 350 gal. ▶ Max Horsepower: 870 ▶ Available Power: Twin 435 hp Volvo Penta IPS600 diesels

Price: \$903,704 (with test power)

▼ BOATING Certified Test Results

SPEED			EFFICIENCY				OPERATION		
rpm	knots	mph	gph	naut. mpg	stat. mpg	n. mi. range	s. mi. range	angle	sound level
1000	4.78	5.50	1.40	3.41	3.93	1075	1238	1	68
1500	5.65	6.50	3.50	1.61	1.86	508	585	3	73
2000	6.52	7.50	7.20	0.91	1.04	285	328	4	75
2500	9.12	10.50	11.00	0.83	0.95	261	301	6	78
3000	12.60	14.50	13.00	0.97	1.12	305	351	6	88
3500	23.90	27.50	19.60	1.22	1.40	384	442	4	90
4000	28.24	32.50	27.80	1.02	1.17	320	368	3	93
4500	32.59	37.50	36.60	0.89	1.02	280	323	3	96
5000	36.93	42.50	43.20	0.85	0.98	269	310	2	92
5500	41.28	47.50	50.00	0.83	0.95	260	299	2	95
5800	46.49	53.50	52.00	0.89	1.03	282	324	1	96

MOST ECONOMICAL CRUISING SPEED

HOW WE TESTED

ENGINE: Twin 435 hp Volvo Penta IPS600 diesels DRIVE/PROPS: IPS pods/T-3 bronze propsets GEAR RATIO: 1.82:1 FUEL LOAD: 300 gal. WATER ON BOARD: 30 gal. CREW WEIGHT: 900 lb.

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SWIPE IMAGE FOR GALLERY >>

Contender 22 Sport

CONTENDER DESIGNED THE NEW 22 SPORT FOR first-time boat buyers. “This boat is a starter boat for those in their mid-20s to 30s,” said Jordan DeLong, project manager for Contender. “It’s for someone who has always wanted a Contender but couldn’t quite swing it financially before this.”

The smallest model in Contender’s current lineup, the 22 Sport accommodates the family with seating that includes a pair in the stern quarters, one on the front of the center-console, and two elevated pods with snap-on upholstery and a filler cushion forward that creates U-shaped seating in the bow. Padded coaming bolsters wrap around the bow and transom areas to serve as backrests.

Accessible via a door on the starboard side, the console interior offers 5 feet 4 inches of headroom for changing into a swimsuit. There’s space for a portable marine toilet, or you can order an optional permanent marine head.

A pair of integral swim platforms — one on either side of the splashwell — with a walkway between just abaft the transom bulkhead accommodates families who like to swim and dive. A pullout swim ladder on the starboard side lets you easily climb back aboard.

This Contender reflects the brand’s sport-fishing DNA with a 26-gallon pressurized transom livewell, a 94-gallon fish locker under the foredeck, and two 30-gallon fish boxes flanking the aft

cockpit sole.

A central hatch in the aft cockpit offers access to the bilge rigging, with the batteries under the seats in each stern quarter. You’ll also find a 95-gallon dry-storage compartment under each elevated forward seating pod. All hatches are gasketed and guttered to channel away water, and deck hatches feature compression latches.

An anodized-aluminum grab rail wraps from amidships around the bow to enhance safety, but it is recessed and unobtrusive. The stainless-steel bow fixture for the red/green running lights folds flat during daylight hours. All cleats push down when not needed. Two gunwale rod holders on each side of the boat are ideal for trolling.

Stow your rods in a four-rod vertical rack along the port side of the pod-style center-console and in a three-rod rack on the backside of the leaning post. A Frigid Rigid cooler secures underneath. We found the leaning post seat was installed a tad too close to the wheel. Larger crew might find the spacing a bit cramped here.

Nineteen-inch walkways beside the console allow you to easily fight a fish down the rail. Our boat was equipped with a canvas T-top and an anodized-aluminum frame, which provided a great place to hold on while underway.

There’s ample room for three anglers to fish across the stern. The grit-style nonskid provides great traction. With a

➔ **Contender 22 Sport**

self-bailing deck, the boat can quickly drain any green water. Gunwales are 24 inches high in the aft cockpit, rising to 26 inches tall in the bow. Our tester featured both freshwater and raw-water washdown systems with slinky-style hoses and contoured holders for each.

Our tester lacked electronics, but the 31-inch-wide helm panel will easily accommodate a 16-inch multifunction display. A special visor atop the panel helps reduce glare on the helm panel.

The anchor locker on the 22 Sport offers copious room for line and a pipe to contain the shank of the anchor. There's an integral bracket on the inner rim of the locker in which the crossbars of a Danforth-style anchor can nest. A pull-up cleat

under the hatch provides a convenient and tidy way to tie off the anchor line.

Powered by a Yamaha F250 outboard with digital throttle and shift, the 22 Sport is a spirited performer. With 40 gallons of fuel on board and turning a 13¾-by-19-inch Yamaha Reliance three-blade stainless-steel propeller, the Contender jumped on plane in 4.2 seconds and accelerated to 30 mph in eight seconds.

We recorded a top speed of 55.5 mph at 5,900 rpm, while the Yamaha F250 burned 24.5 gallons per hour according to the Yamaha Command Link Plus gauge. Most economical cruising speed came at 4,500 rpm and

41.5 mph while the F250 sipped just 14.4 gallons per hour for 2.88 mpg.

With 22.5 degrees of deadrise at the transom, the hull knifed smoothly through waves, which were running up to 3 feet in the waters outside Florida's Key Largo on test day. Uflex hydraulic steering eased the task of maneuvering through the numerous crab-pot buoys. The hull's response to steering input was quick and predictable at all speeds.

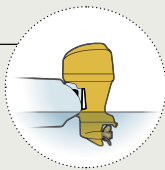
Looking for a comparison model? Robalo's R222 (\$58,697 comparably equipped and with a Yamaha F250) is 1 foot shorter and has 11 gallons less livewell capacity, but seats more crew across the stern and has a transom door.

At a time when center-console boats seem to be getting bigger every year, it's good to see that builders such as Contender refuse to neglect the smaller end of the spectrum, especially with a model that's relatively swift, can tackle rough water and is also fuel efficient. — *Jim Hendricks*



Check out a video walk-through of the Contender 22 Sport by tapping here or visiting boatingmag.com/2887.

AVAILABLE POWER:
OUTBOARD



SWIPE IMAGE FOR GALLERY >>

High Points

- ▶ There's seating aboard for eight crew members, plus two passengers at the helm.
- ▶ Walk-across lets you easily move from one swim platform to the other.
- ▶ Rough-water handling is remarkably smooth for a 22½-footer.

Low Points

- ▶ Leaning post seat needs to move aft a few inches from the wheel, an easy fix.
- ▶ Console top could use a fiddle to keep items from sliding off.
- ▶ A footrest for the helm seating would be great for bracing yourself while underway.

▶ **LOA:** 22'6" ▶ **Beam:** 8'6" ▶ **Draft:** 1'6" ▶ **Displacement:** 4,450 lb. (dry, with power)
▶ **Transom Deadrise:** 22½ degrees ▶ **Bridge Clearance:** 8'0" (with T-top) ▶ **Fuel Capacity:** 100 gal. ▶ **Max Horsepower:** 300 ▶ **Available Power:** Single or twin Yamaha outboards up to 300 hp

Price: \$86,177 (as tested)

▼ **BOATING Certified Test Results**

SPEED			EFFICIENCY				OPERATION		
rpm	knots	mph	gph	naut. mpg	stat. mpg	n. mi. range	s. mi. range	angle	sound level
1000	4.78	5.50	1.30	3.68	4.23	331	381	0	68
1500	6.52	7.50	2.30	2.83	3.26	255	293	2	69
2000	7.39	8.50	3.70	2.00	2.30	180	207	4	73
2500	9.12	10.50	5.50	1.66	1.91	149	172	6	79
3000	11.30	13.00	7.80	1.45	1.67	130	150	8	80
3500	16.95	19.50	9.30	1.82	2.10	164	189	6	86
4000	28.68	33.00	11.50	2.49	2.87	224	258	2	87
4500	36.06	41.50	14.40	2.50	2.88	225	259	1	88
5000	41.71	48.00	17.80	2.34	2.70	211	243	1	92
5500	46.92	54.00	22.00	2.13	2.45	192	221	1	98
5900	48.23	55.50	24.50	1.97	2.27	177	204	1	101

MOST ECONOMICAL CRUISING SPEED

HOW WE TESTED





ENGINES: Single 250 hp Yamaha F250 outboard **PROP:** Yamaha Reliance 13¾" x 19" 3-blade stainless steel **GEAR RATIO:** 2.00:1 **FUEL LOAD:** 40 gal. **CREW WEIGHT:** 590 lb.

Contender Boats Homestead, Florida; 800-645-2906; contenderoffshore.com

Optional removable backrests for the seats in the stern quarters offer additional back support for crew members who want to rest their legs and kick back.

■ **NOTEWORTHY**

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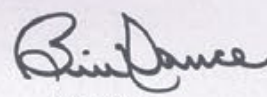


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VIDEO  Scan to see what it's like to hop in the boat and go fishing with Bill Dance




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Carolina Cat 23SD

ONLY IN A CAT COULD BEING SQUARE BE so cool. Step aboard the Carolina Cat 23SD (Sun Deck) and you'll instantly appreciate how the 23SD's wide paw print is carried forward from stern to bow. Aft, the spacious L-lounge, with accessory table, is designed for comfort and conversation. Upholstery is heavy grade, yet appealing, and there are ample cup holders for a full crew of 10. Dry stowage beneath the seats is more than generous.

Moving to the cockpit, the dual-console layout puts all gauges and controls within easy reach of the cushy captain's chair on the starboard side. There's a full stand-up head on the port side, and conversation flows easily from

the cockpit to both stern and bow lounges. Opt for the Fusion 205 stereo system with Bluetooth and let the party begin.

More than a pontoon platform, the 23SD sports Carolina Cat's extremely efficient catamaran hull design to deliver big-boat performance in a midsize package. It's more puma than kitty, and during our test it proved capable of taming coastal chop at speeds approaching 40 mph. It rode smooth and landed soft and delivered a feeling of

control despite the brisk wind whipping up the waters of Long Island Sound. With a range of over 250 miles at 26 mph and an 11-inch draft, it can ferry you to the nearest waterfront dining, cruise to destination hot spots or skim over the flats to reach a favorite rafting cove.

EXTRA POINT

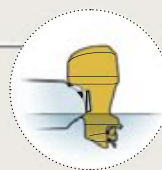
With its twin outboards spread apart, a wide center-transom swim platform makes water access a breeze. There's a sturdy swim ladder in the port bow for easy re-entry.

Our test boat was outfitted with the maximum power it's rated for: twin Yamaha F115 outboards. These, naturally, trim completely clear of the water, providing a great anti-corrosion benefit to those who keep their boat at a dock or mooring. The ability to operate in shallow waters is also enhanced. As to handling, we were impressed during our test of the Carolina Cat 23SD. In a series of tight-quarters maneuvers, it turned within its length and offered precision response dockside, thanks to the dual hull draft and the powerhouses being positioned toward the outside edges of this catamaran's generous beam. The 23SD clawed out of the hole with enough pop to pull a skier up or drag a tube around the bay. The boat leveled off without compromise of forward vision. We reached a top speed of 40.6 mph. Meow. — *Tom Schlichter*

MORE ONLINE

For a photo gallery of the Carolina Cat 23SD, visit boatingmag.com/2888.

AVAILABLE POWER:
TWIN OUTBOARDS



High Points

- ▶ Catamaran hull affords great stability and a soft ride in chop.
- ▶ Smooth ride offers sufficient speed, range and seakeeping ability for destination cruising.
- ▶ Self-bailing cockpit reduces the reliance on bilge pumps that other runabouts must suffer.

Low Points

- ▶ We would have added a port to the head for ventilation and light.
- ▶ A single, continuous tub serves for dry stowage beneath the L-shaped aft lounge. Splitting it into two would limit gear shifts.
- ▶ Call us greedy, but we'd still like a little more speed, even in a top cat.

Toughest Competitor

- ▶ NauticStar's 243 DC (\$72,913 with a single Yamaha F250) has less lounging space yet tops out at 51 mph.

▶ LOA: 22'7" ▶ Beam: 8'6" ▶ Draft: 11" ▶ Displacement (approx.): 5,226 lb.
▶ Transom Deadrise: 0 degrees ▶ Bridge Clearance: 4'7" ▶ Fuel Capacity: 93 gal.
▶ Max Horsepower: 230 ▶ Available Power: Twin Yamaha F115 4-stroke outboards

Price: \$89,665 (as tested)

BOATING Certified Test Results

SPEED			EFFICIENCY				OPERATION		
rpm	knots	mph	gph	naut. mpg	stat. mpg	n. mi. range	s. mi. range	angle	sound level
1000	4.08	4.70	0.90	4.54	5.22	380	437	0	66
1500	6.52	7.50	1.70	3.83	4.41	321	369	1	66
2000	7.56	8.70	2.70	2.70	3.11	226	260	3	68
2500	8.60	9.90	4.00	2.15	2.48	180	207	5	73
3000	12.34	14.20	5.40	2.29	2.63	191	220	6	78
3500	18.25	21.00	7.00	2.61	3.00	218	251	4	78
4000	22.77	26.20	8.60	2.65	3.05	222	255	4	79
4500	26.07	30.00	10.80	2.41	2.78	202	233	3	83
5000	29.70	33.00	13.60	2.18	2.43	183	203	3	88
5500	31.20	35.90	17.00	1.84	2.11	154	177	3	88
6000	33.02	38.00	21.00	1.57	1.81	132	151	2	90
6250	35.28	40.60	22.00	1.60	1.85	134	154	2	91

MOST ECONOMICAL CRUISING SPEED

HOW WE TESTED

ENGINES: Twin Yamaha F115 4-stroke outboards DRIVES/PROPS: Performance 13.25" x 16" 3-blade polished stainless steel GEAR RATIO: 2.15:1 FUEL LOAD: 80 gal. CREW WEIGHT: 730 lb.

Carolina Cat Tarboro, North Carolina; 252-774-5153; carolinacatboats.com



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Sea Chaser 22 HFC

IT DOESN'T MATTER HOW HARD-CORE AN angler you are or desire to be; when family is involved in the boat-purchasing decision, they are going to want amenities. Center-console builders have wised up to that, building serious fishing machines with actual places to sit, tan and socialize. The new Sea Chaser 22 HFC,

EXTRA POINT

The seating in front of the console lifts up on gas struts for access to the head, which features a foldaway privacy curtain similar to those found on pontoon boats.

cushions over hatches. The cushion to starboard lifts to reveal an insulated built-in cooler. The larger hatch to center opens for access to the batteries, bilge and other ship systems. An added backrest extends above the transom topside to provide more passenger comfort.

Cruising passengers can rest a cold beverage in one of eight LED-lit cup holders placed throughout the boat, including two in the bow area. The bow features snap-on cushions to easily convert the boat from fishing to lounging duty. Removable backrests slide in to create

built by Carolina Skiff, provides just such a platform — the HFC in the name fittingly stands for Hybrid Fish and Cruise.

For cruising, the family will like the bench that runs almost the entire length of the transom, save for the area to port where the 25-gallon livewell is installed. The bench features two separate

twin forward-facing loungers. There's a pedestal base for a cockpit table on the hatch opening to the insole 32-gallon fish box. There's another 52 gallons of storage capacity under the U-shaped seating. There's also a removable 100-quart cooler under the helm leaning post.

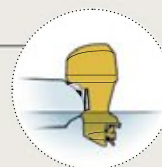
Fishing features? Besides the aforementioned livewell and fish box, there's rod storage built into each gunwale, with room for three rods per side. There's a raw-water washdown, plus four rod holders built into the topsides, four more in the leaning post and four on the T-top.

Underway, the boat climbed onto plane fairly quickly with no real squatting or loss of visibility at the helm. With the 200 hp Suzuki test power, it accelerated to 30 mph in about seven seconds on its way to a 44.7 mph top end. The top of the swim step corners dipped a little too low to the water during hard-over turns at 30 mph, causing drag and throwing spray, but otherwise the boat performed well in a light bay chop. — *Pete McDonald*

MORE ONLINE

For a photo gallery of the Sea Chaser 22 HFC, visit boatingmag.com/2889.

AVAILABLE POWER:
OUTBOARD



High Points

- ▶ Oval-shaped livewell to port has a blue interior and a clear lid.
- ▶ Coaming bolsters extend all the way to the bow seating area.
- ▶ Recessed safety rails in the bow make great handholds while cruising and won't interfere with fishing.

Low Points

- ▶ Stainless-steel flip-up cleats are nice, but installing midship cleats would aid in tying off with spring lines at the dock or in a slip.
- ▶ We'd like to see Sea Chaser add toe rails for added security when fighting fish along the gunwales.

Toughest Competitor

- ▶ The Sea Fox 226 Commander (\$52,000 with a 200 hp Yamaha) is another fishing center-console with family-friendly features.

▶ **LOA:** 21'9" ▶ **Beam:** 8'5" ▶ **Draft (max):** 3'0" ▶ **Displacement (approx.):** 2,700 lb.
▶ **Transom Deadrise:** 16 degrees ▶ **Bridge Clearance:** 8'0" ▶ **Fuel Capacity:** 76 gal.
▶ **Max Horsepower:** 250 ▶ **Available Power:** Single Mercury, Yamaha, Honda or Suzuki gasoline outboards

Price: \$33,923 (without power)

BOATING Certified Test Results

SPEED			EFFICIENCY				OPERATION		
rpm	knots	mph	gph	naut. mpg	stat. mpg	n. mi. range	s. mi. range	angle	sound level
1000	3.91	4.50	1.00	3.91	4.50	267	308	1	61
1500	5.21	6.00	1.80	2.90	3.33	198	228	2	66
2000	6.43	7.40	2.70	2.38	2.74	163	187	4	71
2500	7.39	8.50	4.50	1.64	1.89	112	129	5	75
3000	11.99	13.80	6.00	2.00	2.30	137	157	3	77
3500	19.29	22.20	7.80	2.47	2.85	169	195	2	80
4000	24.16	27.80	9.60	2.52	2.90	172	198	2	83
4500	28.33	32.60	12.00	2.36	2.72	161	186	2	86
5000	31.02	35.70	17.00	1.82	2.10	125	144	2	87
5500	35.45	40.80	18.00	1.97	2.27	135	155	1	88
6000	38.84	44.70	18.80	2.07	2.38	141	163	1	90

MOST ECONOMICAL CRUISING SPEED

HOW WE TESTED

ENGINE: Single 200 hp Suzuki DF200 outboard **PROPS:** 16" x 21.5" 3-blade stainless steel **GEAR RATIO:** 2.50:1 **FUEL LOAD:** 60 gal. **CREW WEIGHT:** 380 lb.

Sea Chaser by Carolina Skiff Waycross, Georgia; 800-422-7282; carolinaskiff.com

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Wellcraft 35 Scarab Offshore Tournament

WE SAY Dockside, the fishing and go-fast features of Wellcraft's 35 Scarab Offshore Tournament grabbed our attention. Offshore, this boat proved a standout in both categories. We wrung over 62 mph out of it at maximum

power. The deep-V hull, made famous by the 1980s crime drama *Miami Vice*, is now 2 inches broader, and power capacity now tops 1,000 horses.

The use of PVC foam in the stringers, transom and hull maintains strength and stiffness without excess weight. With "lines in," the big 35 Scarab Offshore Tournament flexes its fishing potential with a powder-coated aluminum T-top fitted with gold-tone rod holders, spreader lights and an oversize electronics box with life jacket stowage. These reside above a helm with fully digitized instrumentation. Aft of the helm is a sink with a rigging station, livewell, walk-through transom door and fold-out tackle compartments.

In the business of building performance fishing boats for over 50 years, Wellcraft is part of Rec Boat Holdings, which was recently purchased by Beneteau Group, one of the world's largest pleasure-boat builders — which bodes well for the continuance of these iconic boats. — *Dan Armitage*

WHO'D WANT ONE Anglers who'd like to scoff at chop while zooming offshore.

ANOTHER CHOICE Everglades' 355T (\$439,407 with triple 300 hp Yamaha outboards)

BOTTOM LINE: \$236,730 (with test power); wellcraft.com

▶ BOATING Certified Test Results

rpm	SPEED			EFFICIENCY					OPERATION	
	knots	mph	gph	naut. mpg	stat. mpg	n. mi. range	s. mi. range	angle	sound level	
1000	6.08	7.00	2.20	2.76	3.18	936	1077	N/A	N/A	
1500	7.65	8.80	5.10	1.50	1.73	507	584	N/A	N/A	
2000	9.78	11.25	14.30	0.68	0.79	231	266	N/A	N/A	
2500	16.51	19.00	21.30	0.78	0.89	262	302	N/A	N/A	
3000	25.11	28.90	24.20	1.04	1.19	351	404	N/A	N/A	
3500	31.28	36.00	29.50	1.06	1.22	359	413	N/A	N/A	
4000	36.50	42.00	36.00	1.01	1.17	343	395	N/A	N/A	
4500	40.84	47.00	47.40	0.86	0.99	292	336	N/A	N/A	
5000	46.06	53.00	65.00	0.71	0.82	240	276	N/A	N/A	
5500	49.90	58.10	78.20	0.64	0.74	216	251	N/A	N/A	
5900	53.88	62.00	79.50	0.68	0.78	229	264	N/A	N/A	

MOST ECONOMICAL CRUISING SPEED

▶ LOA: 35'4" ▶ Beam: 9'1" ▶ Draft: 2'9" ▶ Displacement (approx.): 8,600 lb.

HOW WE TESTED

Engines: Triple 300 hp Evinrude G2 E-TEC Props: 15" x 21" 3-blade stainless steel Gear Ratio: 1.85:1 Fuel Load: 200 gal. Crew Weight: 400 lb.

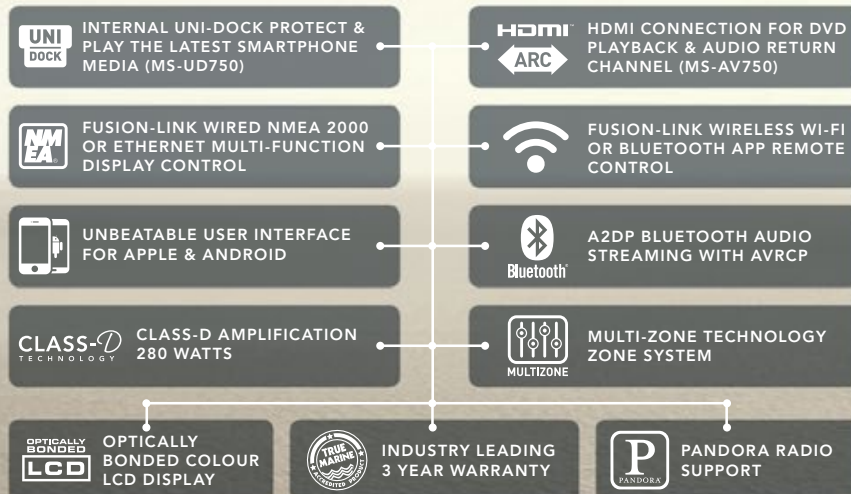
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// To learn more about the many other Helm Master features, visit YamahaOutboards.com/HelmMaster.

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Reliability Starts Here.®





Robalo R300

WE SAY It has *everything* a serious tournament angler would need in a package that is rugged, smooth riding, stable at rest and chock full of standard features that are typically found only as options on most competitors.

Things like the windlass, dual livewells, coaming bolsters and a hideaway

transom seat are all standard. Even the helm compartment is equipped with a VacuFlush head. Bolsters and snap-off cushions on the back of the leaning post add more conversational seating.

Beneath them are a freshwater sink and one of those two livewells. Beneath the bolsters, tackle compartments hold utility boxes, tools and cellphones. Cabinets below house more tackle storage and access to the plumbing.

Shotgun rod holders on the transom flank stainless-steel cup holders.

The hardtop sports more standards, including stereo speakers, outriggers and spreader lights. The wide helm is protected by a glass windshield. The captain and mate get bucket seats with lumbar support, flip-up bolsters and footrests.

A dual seat on the front of the console hides a cooler, and there are snap-off cushions on the forward casting decks.

There's very little missing from the R300 — unless maybe it's your crew.

— Randy Vance

WHO'D WANT ONE Offshore anglers seeking serious angling capabilities.

ANOTHER CHOICE Mako's 284 CC (\$136,715 with dual Verado 300s with joystick piloting).

BOTTOM LINE \$194,638 (as tested); robalo.com

▼ BOATING Certified Test Results

rpm	SPEED		EFFICIENCY				OPERATION	
	knots	mph	naut. gph	stat. mpg	n. mi. mpg	s. mi. range	angle	sound level
1000	6.08	7.00	2.20	2.76	3.18	936	1077	0 0
1500	7.65	8.80	5.10	1.50	1.73	507	584	0 0
2000	9.78	11.25	14.30	0.68	0.79	231	266	0 0
2500	16.51	19.00	21.30	0.78	0.89	262	302	0 0
3000	25.11	28.90	24.20	1.04	1.19	351	404	0 0
3500	31.28	36.00	29.50	1.06	1.22	359	413	0 0
4000	36.50	42.00	36.00	1.01	1.17	343	395	0 0
4500	40.84	47.00	47.40	0.86	0.99	292	336	0 0
5000	46.06	53.00	65.00	0.71	0.82	240	276	0 0
5500	49.90	58.10	78.20	0.64	0.74	216	251	0 0
5900	53.88	62.00	79.50	0.68	0.78	229	264	0 0

MOST ECONOMICAL CRUISING SPEED

► LOA: 29'2" ► Beam: 10'6" ► Draft: 1'9" (drives up)
► Displacement (approx.): 8,200 lb. (with engines)

HOW WE TESTED

ENGINES: Twin Yamaha F300s DRIVE/PROP: Saltwater Series II 15¼" x 19" stainless steel GEAR RATIO: 1.75:1 FUEL LOAD: 75 gal. CREW WEIGHT: 230 lb.

PHOTO: COURTESY ROBALO

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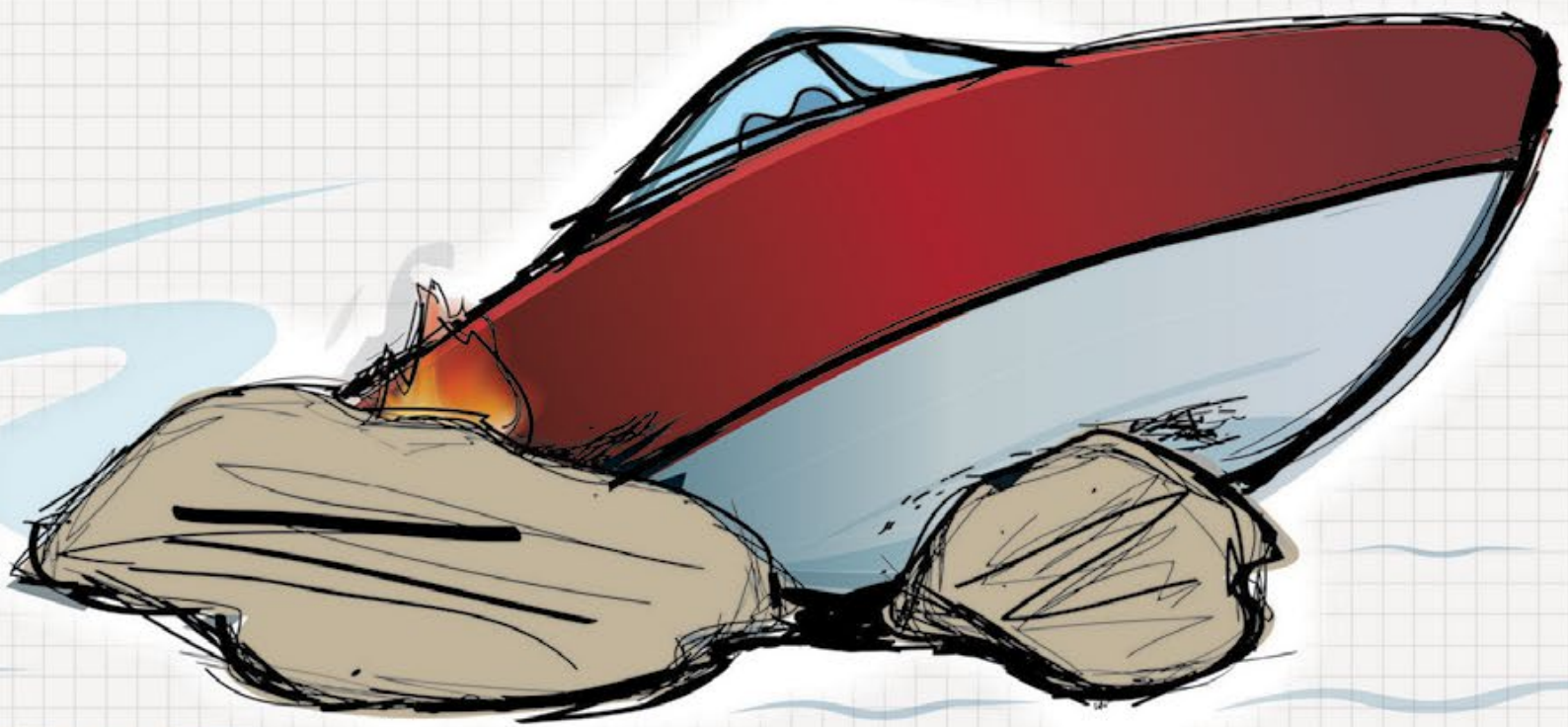
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Motorhead

Loose Juice

10 STEPS TO FIXING FUEL LEAKS

HIGH ANXIETY? NOTHING BRINGS IT ON FASTER THAN A FUEL leak aboard a boat. This happened to me a few years ago when I found gasoline streaming into the bilge. Everything else became secondary to stemming the flow of loose go-juice. What I learned might help if you're faced with a similar situation.

1 MOVE QUICKLY Procrastination can have major consequences, ranging from a fuel spill (and costly fine) to a catastrophic explosion and fire.

2 TURN ON THE BILGE BLOWER If your boat has a bilge blower, use it to clear out fumes. Yet be sure the blower fan is indeed rated for ignition projection, as required by the American Boat and Yacht Council (ABYC).

3 OPEN ALL HATCHES It's important to prevent fumes from accumulating. So remove any shrink-wrap or boat covers and prop open all hatches to air out the bilge, regardless of whether you have a bilge blower or not.

4 CLOSE ALL FUEL VALVES If the leak is downstream of the valve, this will stem the flow. If the flow stops after a valve is closed, it can also help you zero in on the location of the leak.

5 AVOID IGNITION SOURCES While marine pumps and motors are ignition protected (meaning they will not emit an open spark), items such as drill motors, power drivers and jigsaws are not. So don't use these — or allow anyone to smoke or light a match — near the boat until the leak is fixed and the fuel has been cleaned up.

6 FIND THE LEAK This might be easier said than done. In my case, corrosion had eaten away at the bottom of the aluminum fuel tank, leaving pinholes. There was no way to see the leak. In other cases, such as a rotten hose or cracked fuel fitting, you might be able to find the leak right away.

7 CONTAIN THE SPILL It is illegal to dump fuel, oil or other contaminants into waterways, so don't use your bilge pump to jettison fuel. Likewise,

if your boat's on a trailer, don't dump fuel onto the ground. Use absorbent pads to soak up the fuel, and then carry them in buckets to a hazardous-waste disposal site. Your marine patrol or marina

manager can point you to the closest one. When transporting the soaked pads, avoid carrying them in an enclosed space such as a car trunk where fumes can accumulate. Instead, use the open bed of a pickup truck.

8 DRAIN THE TANK If the fuel tank is leaking, you'll need to empty it quickly to stem the leak. You can drain it by disconnecting the

fuel line downstream of the fuel tank. With the boat on a trailer or on blocks, you can also siphon it out by feeding a hose down the fuel fill. In either case, place the other end of the hose below the fuel tank. Connect a primer bulb to the hose to get the fuel flowing.

9 CONTAIN THE FUEL If you're draining the tank, estimate the volume of fuel and have an equivalent volume of fuel containers standing by. As one is filling, have the next one at the ready to minimize spillage. Use metal containers, because ungrounded plastic fuel containers tend to generate static electricity as fuel is flowing into them.

10 DISPOSE OF THE FUEL This is the easy part. Find a neighbor who needs fuel for his boat or vehicle and offer to fill his tank. Or you can keep the fuel to refill your tank once it has been repaired or replaced. For the latter, add stabilizer to help prevent the fuel from going bad while it is in storage.

Finally, I am reminded by *Boating* contributor and ABYC Vice President/education director Ed Sherman that under ABYC standards, fuel system inspections for leaks are recommended annually, if not more frequently, instead of the first time you smell fuel.
— Jim Hendricks

QUICK TIP

Clean the bilge with a product like Star brite Heavy Duty Bilge Cleaner (\$10.90; wholesalemarine.com).



Big, Bucking Horses!

Seven Marine's new 627 is the world's most powerful outboard. Upping the ante from the company's first offering — the 557 — this 627 hp engine has a horizontal V-8 powerhead, high-turbulence combustion technology and LED illumination of the cowl. \$89,685 (plus \$2,999 for LEDs); sevenmarine.com — J.H.




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29 strategies for surviving lightning strikes

KA-BOOM!

By Mike Telleria

POWERFUL, DANGEROUS, HIGHLY UNPREDICTABLE — all are common descriptions of lightning. A direct strike that results only in ringing ears and a few roasted electronics would be considered lucky. Unlucky would be through-hulls blown out, a sunk boat or worse — possibly serious injury or death.

Many powerboaters like to think that they've got the speed to simply outrun or get out of the way of thunderstorms, or they figure they're safe if they go boating only when it's clear and sunny. That's an attitude aided by the low odds of a boat being struck by lightning, which BoatU.S. pegs at about one out of 1,000 boats in any given year. No worries, right, mate?

Wrong. Engines can malfunction; big storms can leave no room to escape; sunny mornings can turn into dark, threatening afternoons. If yours is the only boat in the area during a lightning storm, the odds of being struck go way up, leaving you and your crew vulnerable to millions of volts raining down from the skies. While manufacturers can build in a degree of protection, lightning protection begins with boaters being informed and prepared to take action in the event of a thunderstorm or actual strike. You should know the following techniques and strategies.

COUNT THE SECONDS AFTER A THUNDERCLAP AND DIVIDE BY 5: THE RESULT IS THE DISTANCE IN MILES FROM THE STORM

15
SECONDS
÷ 5
3
MILES



ANVIL POINTS IN DIRECTION STORM IS MOVING

⚡ TIMING

A strategy of boating only on sunny, cloudless days may work well in places like Idaho and California, but that would mean almost never using the boat in places such as Florida, Louisiana and much of the Midwest.

For example, most of Florida — the Sunshine State — has at least 70 to 80 thunderstorm days per year, with some parts having more than 100 thunderstorm days per year (with increased activity during the summer months).

Absolutely, boaters should track VHF, Internet and television weather reports and make responsible decisions about whether to go boating depending on the likelihood of storms. Short-term forecasts can actually be fairly good at predicting bigger storms, but small, localized storms might not be reported. This is when knowing how to read the weather yourself can come in handy. (The U.S. Power Squadrons offers great weather courses for boaters, and there are many books that cover the basics.)

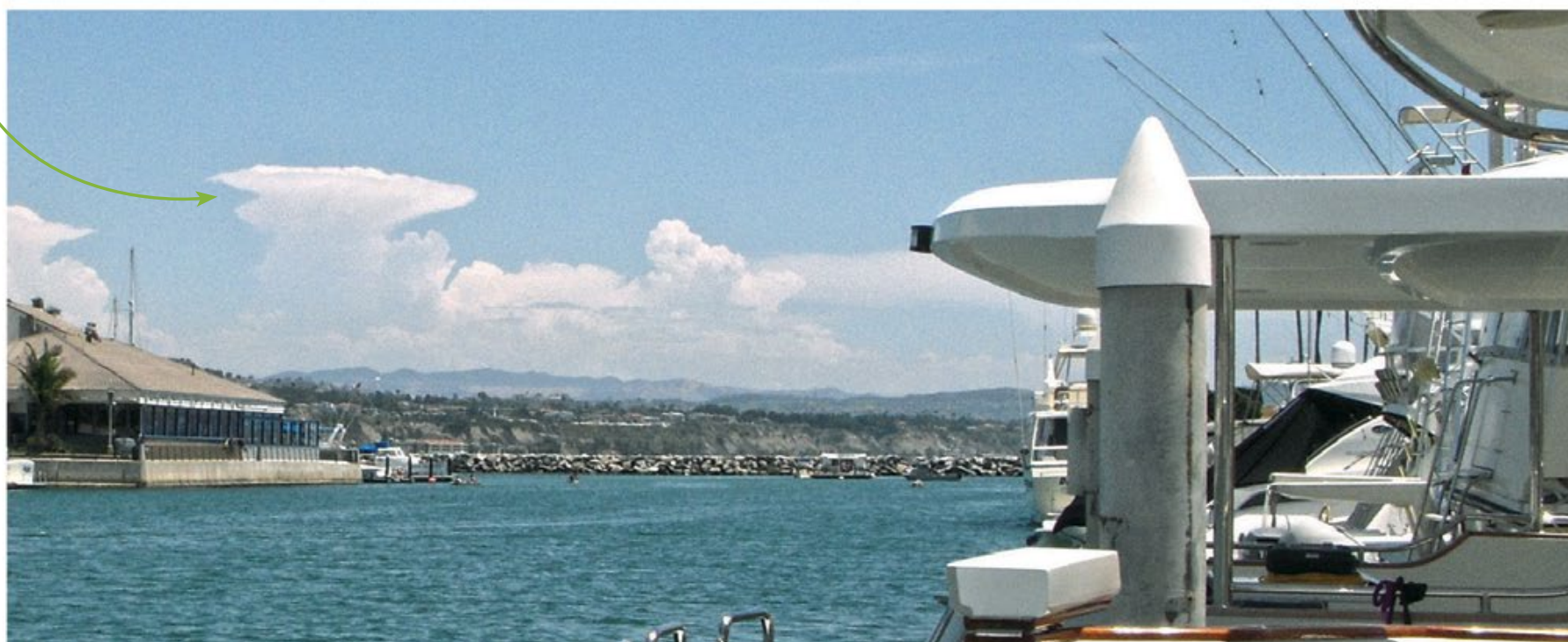
Lightning strikes typically occur in the afternoon. (Florida estimates 70 percent occur between noon and 6 p.m.) A towering buildup of puffy, cotton-white clouds that rise to the customary flat “anvil” top is a good indication to clear the water and seek shelter — or move out of the storm’s path if possible. That’s if the storm is at least somewhat off in the distance (most storms are about 15 miles in diameter and can build to dangerous levels in fewer than 30 minutes). If



Most strikes occur between noon and 6 p.m.

lightning and thunder are present, just count the seconds between the lightning and corresponding thunder and then divide by 5 — this will provide a rough estimate of how many miles away the storm is.

A storm that builds directly overhead might be less obvious until those pretty white clouds that were providing some nice shade moments ago turn a threatening hue of gray as rain dumps on you and the wind starts to howl or, worse yet, boom with thunder and lightning





that are right on top of each other. Now is the time for a mad dash to the dock and shelter if close by. Like the National Weather Service says: “When thunder roars, go indoors!” If out on open water or too far from shore and shelter, it’s time to hunker down and ride it out.

⚡ CAUGHT!

Boaters who have been struck by lightning often begin their stories with “I was caught in this storm ...” before they share their miraculous or harrowing tales of survival and destruction (BoatU.S. has a number of first-person storm stories archived online: boatus.com/seaworthy/swthunder). Even though getting caught in a storm is not always avoidable, there’s still plenty that boaters can do to minimize the chance of a strike and lessen injury and damage if there is a strike.

We all learn in grade school that lightning seeks the highest point, and on the water

Listen to NOAA Weather Radio for special alerts on VHF channels 1-9 (most often it’s Channel 3).

Use only handheld radios during a storm; the fixed unit is a lightning rod.



that’s the top of the boat — typically a mast, antenna, Bimini top, fishing rod in a vertical rod holder or even the tallest person in an open boat. If possible, find a protected area out of the wind and drop anchor. If the boat has an enclosed cabin, people should be directed to go inside and stay well away from metal objects, electrical outlets and appliances (it’s a good idea to don life jackets too). Side flashes can jump from metal objects to other objects — even bodies — as they seek a path to water.

Lowering antennas, towers, fishing rods and outriggers is also advised, unless they’re part of a designated lightning-protection system (see “Protection,” p. 69). Some boaters also like to disconnect the connections and power leads to their antennas and other electronics, which are often damaged or destroyed during a strike or near strike.

Under no circumstances should the VHF radio be used during an electrical storm unless it’s an emergency (handhelds are OK). Also, be careful not to grab two metal objects, like a metal steering wheel and metal railing — that can be a deadly spot to be if there’s a strike. Some boaters opt to steer with a wooden spoon and keep their other hand in a pocket if forced to man the helm during a storm, while others like to wear rubber gloves for insulation.

An open boat like a runabout is the most dangerous to human life, since you are the highest point and most likely to get hit if the boat is struck. If shore is out of reach, the advice is to drop anchor,

STEER WITH A WOODEN SPOON

YES!

NO!



ONE
IN
1,000

BOATS ARE HIT BY LIGHTNING PER YEAR

BoatU.S. gathered insurance claim data from a 10-year period and found that the odds of being struck are about one in 1,000 in any given year (see below for a breakdown by boat type). Location, however, matters a great deal. Florida accounted for 33 percent of all claims, and the Chesapeake Bay area accounted for 29 percent. — M.T.

BOAT TYPE	CHANCES PER 1,000
Multihull Sail	9.1
Auxiliary Sail	4.5
Cruiser	0.86
Sail Only	0.73
Trawlers	0.18
Bass Boat	0.18
Runabout	0.12
Houseboat	0.11
Pontoon	0.03
PWC	0.003



A MICROWAVE OVEN IS A FARADAY CAGE

Anything inside a Faraday cage is safe from lightning. Automobiles, airplanes and microwave ovens are examples of Faraday cages. Stow backup handhelds, laptops and other electronics inside the microwave to protect them during an electrical storm. Just wrapping them in tinfoil can also do the trick.



WAIT
30
MINUTES

after the last strike before resuming normal activities (swimming, skiing, tubing, fishing, etc.).



USE RADAR TO SPOT A DISTANT STORM.

remove all metal jewelry, put on life jackets and get low in the center of the boat. Definitely stay out of the water and stow the fishing rods.

If all goes well, the storm will blow past or rain itself out in 20 to 30 minutes. It's best to wait at least 30 minutes until after the last clap of thunder to resume activities.



ELECTRODE

Multiple lightning rods and side-arc electrodes are part of a new-wave approach to boat lightning protection.

HIT!

Knowing what to do in a storm and having the best lightning-protection system installed on the boat is by no means a guarantee that lightning won't strike. The immediate checklist for a direct hit is very short:

1 Check for unconscious or injured persons first. If they're moving and breathing, they'll likely be OK. Immediately begin CPR on unconscious victims if a pulse and/or breathing is absent — there's no danger of being shocked by someone just struck by lightning.

2 In the meantime, have someone check the bilge for water. It's rare, but lightning can blow out a transducer or through-hull — or even just blow a hole in the boat. Plug the hole, get the bilge pumps running, work the bail bucket — whatever it takes to stay afloat. An emergency call on the VHF is warranted if the

situation is dire. If the radio is toast, break out the flare kit.

If there are no injuries and no holes or major leaks below, just continue to wait it out. Once the danger has passed, check the operation of the engine and all electronics. Even a near strike can fry electronics and an engine's electronic control unit, cutting off

navigation, communication and even propulsion. Some boaters stash charged handheld VHF and GPS units and a spare engine ECU in the microwave or a tin box for this very reason. These makeshift Faraday cages have saved equipment.

Obvious damage will need to be assessed and set right. Even those lucky enough to come away completely unscathed with no apparent damage should have a professional survey done just to be sure. Minor damage to through-hulls can result in slow leaks, and all manner of electrical wackiness can emerge — sometimes much later. It's best to catch these issues right away and get that information to the insurance folks for coverage.

WRITE THE CHECK!

On many levels, robust insurance coverage plays a huge role in your lightning-protection plan. Knowing how to avoid storms and read the weather are certainly important, being ready for action in the event of a storm or strike is crucial, and an upfront investment



PHOTOS: (CLOCKWISE FROM TOP LEFT) SHUTTERSTOCK, COURTESY MARINE LIGHTNING PROTECTION INC., TOM KING (CHAPARRAL), FOREST JOHNSON (MONTEREY); ILLUSTRATION: SHUTTERSTOCK



in lightning protection can lessen destruction. When it comes to dealing with the aftermath of a damaging strike, however, extensive lightning coverage can't be beat.

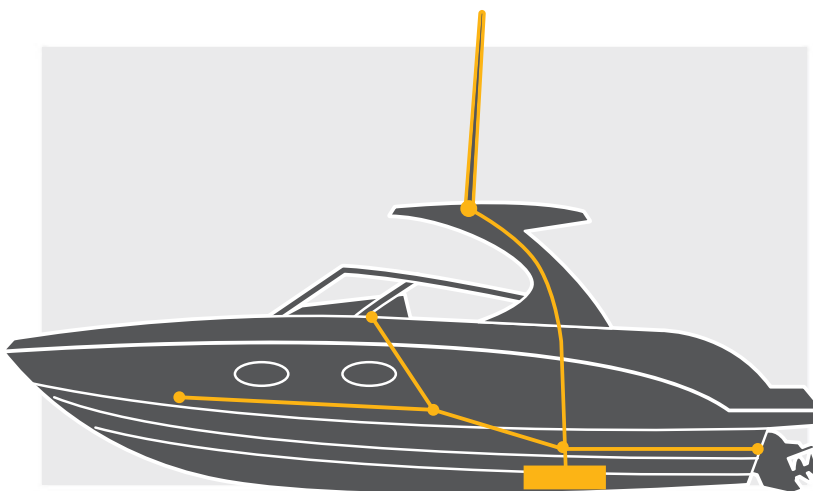
Take it from a luxury trawler owner who sustained more than \$1 million in damage from a strike: "Boat insurance turns out to be the best

investment we have made in the past 10 years!" he said. "We will never again grumble about writing a check for an insurance premium."

This article dealt with actions you can take to avoid lightning damage. To find out about equipment and more, visit boatingmag.com/lightning.

PROTECTION

A conventional lightning-protection system consists of an air terminal (lightning rod) above the boat connected to a thick wire run down to an underwater metal ground plate attached to the hull — large metal objects like tanks, engines and rails are also connected. New studies suggest multiple terminals and multiple ground paths work better.



How to stay safest in a thunderstorm

Research shows boats without a protection system do suffer more damage. Larger enclosed boats, trawlers and sailboats will sometimes come with a conventional protection system installed. With open boats it's typically up to the owner to carry a portable pole with attached wire and ground plate that can be deployed in a storm.



THERE'S A ZAP FOR THAT

A smartphone coupled with real-time National Oceanic and Atmospheric Administration (NOAA) lightning tracking information can make a powerful tool for avoiding storms. Some apps will even notify you if there is a strike near any of your designated areas. Do an Internet search for "lightning app NOAA" — there are a number of iPhone and Android apps available. A little early warning could give you just the time you need to make it back to shore and seek shelter. — M.T.



IS JUST A GROUND PLATE ENOUGH?

An immersed 1-square-foot ground plate with hard edges creates a low-resistance path for lightning current to flow through (instead of through the boat or its crew!). But expert Dr. Ewen Thomson (marinelightning.com) believes multiple rods and near-water electrodes provide better protection.





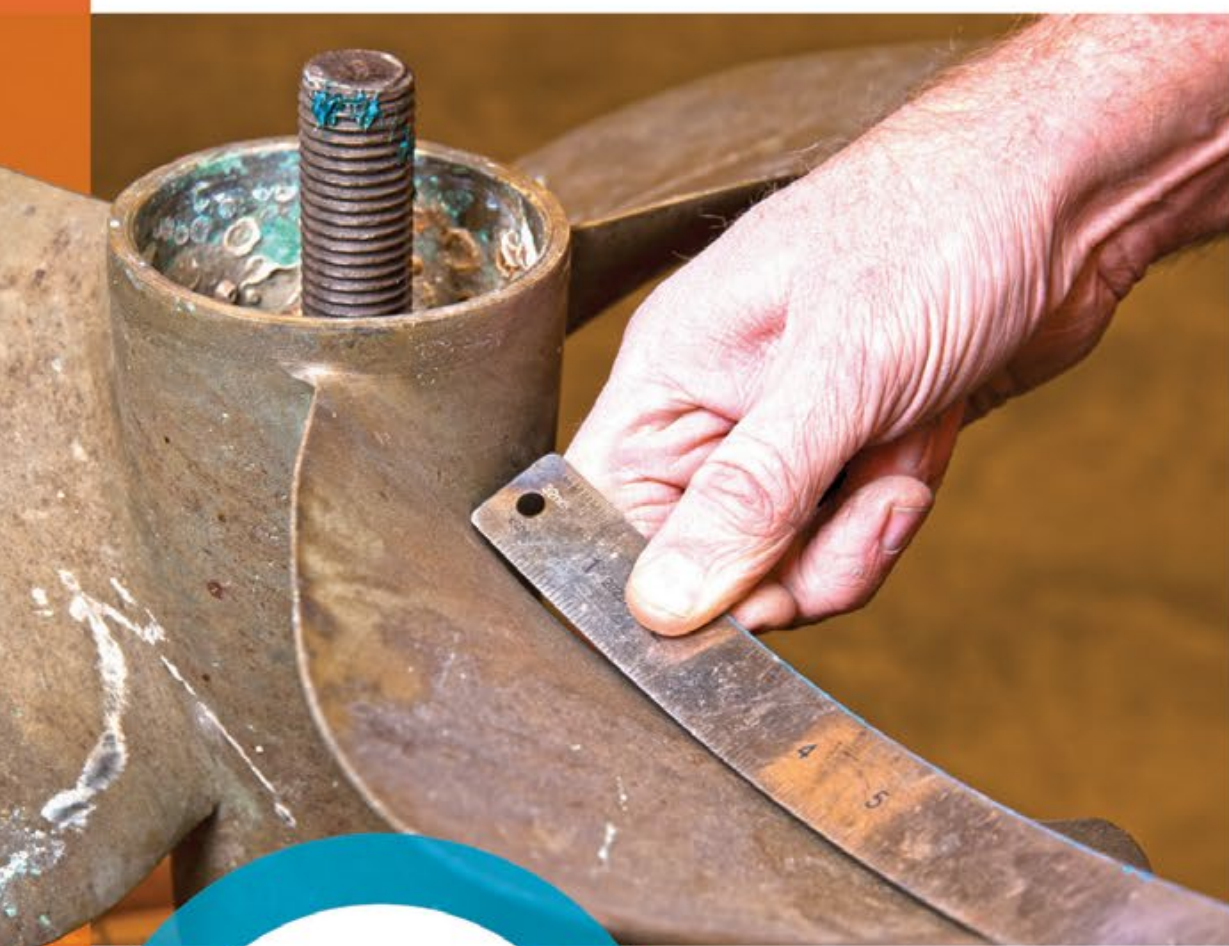
Spin Doctors

Does Computer Propeller Repair Make Boats Run Better?

STORY AND PHOTOGRAPHY BY CAPT. VINCENT DANIELLO

When spiffy, high-tech, high-performance propellers go into the prop shop, they're carefully restored to their original shape with sophisticated, computerized propeller repair tools, right?

Well, no. Prop repair itself hasn't changed in decades — they're heated with a torch and forced into shape with a hammer. What has changed, in fact what makes repairing high-tech propellers practical, is how quickly and precisely propeller shape is measured. *Boating* takes an inside look at the process to unwind the mysteries of propeller repair and cut through the spin of computer measuring and dynamic balancing to answer one question: **How does high-tech prop repair help average boaters?**



20
YEARS AGO

PERFECT PITCH

“Twenty years ago, we used pitch gauges. Half an inch was as fine a measurement as possible,” says Jimmie Harrison, president of Frank & Jimmie’s Propeller in Fort Lauderdale, Florida (fjprop.com). “We measured two points on the blade, typically 3 or 4 inches apart,” he adds, “like the top point and bottom point of a triangle. You don’t know if what’s between is a smooth line or a wavy line.”

As boats went faster, small anomalies in pitch, blade shape or track caused vibration and could affect performance and engine health. In the 1990s, two computerized propeller-measuring devices emerged, Prop Scan (propscanusa.com) and the Hale Propeller Measurement Recording Instrument, or MRI (halepropeller.com). Both map and record hundreds of measurements in thousandths-of-an-inch resolution along that same 3- or 4-inch span measured with a pitch gauge.

“With computer measuring, I document the exact shape of that propeller,” Harrison says. This practice all but eliminates props coming back to his shop a second time. Eliminating props as a cause of a boat’s problems can help a technician diagnose issues more efficiently, and since prop shops retain computer measurement records, future repairs can be far more precise, saving time and money.

ALL DINGED UP

It may be cheaper to simply replace a badly damaged aluminum outboard prop. But stainless-steel props like this one cost enough to warrant getting a repair quote.



BLADE DIAGNOSTICS

“We’re measuring the shape of the blade along any specific radius,” says Randy Hale, who co-invented the Hale MRI along with his father, Randal, a physicist who helped develop medical MRI technology. A typical repair checks three radii, 50 percent from hub to tip, again at 70 percent and also at 90 percent, but six or more radii are checked on the highest accuracy repairs. The computer also indicates blade tracking (how closely each blade follows the same path), spacing between each blade, rake (how far blades extend forward or aft of the prop hub), chord length and even cup height (a slight curve at the trailing edge of the blade). Prop shops charge based on accuracy — Class 2 repairs guarantee prop-blade local pitch (adjacent measurements) within 3 percent of spec and mean pitch (average for the entire prop) within 1 percent. Class 1 measurements fall within 2 percent local pitch and 0.75 percent mean pitch, and Class S repairs are within 1.5 percent

A typical repair checks three radii, 50 percent from hub to tip, again at 70 percent and also at 90 percent, but six or more radii are checked on the highest accuracy repairs.

local and 0.5 percent mean pitch.

If that sounds like splitting hairs, Harrison — a former president of the National Marine Propeller Association — says it is. “We really didn’t know repair accuracy before computer measuring,” he says. “Now we’re taking a very good repair at Class 2 and offering verified levels of increasing accuracy.” Still, there are demonstrable differences. “The majority of boats will run OK at Class 2,” he says, though that might simply be that those props cause a level of vibration boat owners have come to accept. “From our experience, a propeller will not vibrate with a Class 1 repair,” he says. “Going to Class S, we’d hope to see



\$ THE PRICE OF PERFECTION?

Many prop shops take computer measurements on nearly all inboard propellers, and many set Class 1 as their basic repair. Upping to Class S costs about 30 percent more, and dynamic balancing adds roughly 10 percent to either Class 1 or Class S prices. Some shops offer Class 2 repairs for around 25 percent less cash than Class 1, or without a computer for even less. But before saving a few bucks on prop repair, consider the risk of another haul-out or diver fee if propellers don't meet sea-trial expectations. — V.F.D.

some performance benefit." Faster boats generally gain more from tighter prop tolerances. "Boats built light for speed or efficiency need very accurate props," Harrison says, "versus a boat with a heavy hull and oversize running gear that will absorb propeller vibration." Ski boats, built to be light and make minimal wake, can be particularly sensitive to prop repair accuracy.

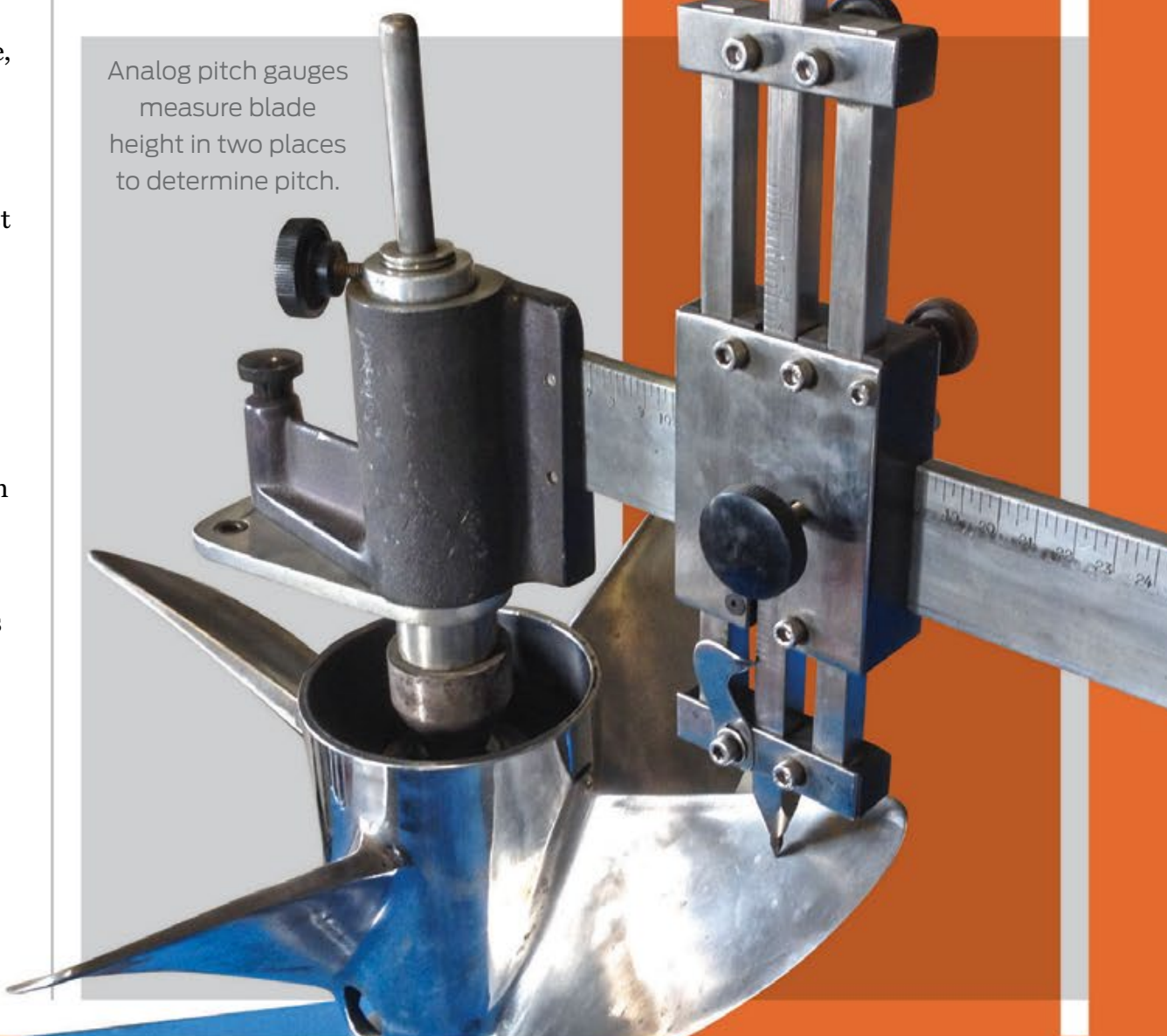
SCIENCE OR ART?

Ironically, high-tech props often rely most on a repair technician's gut. Flat-pitched props are heated and hammered against pitch blocks that define their shape, but newer complex-geometry propellers are often too nuanced for pitch blocks. Technicians alter between measuring and repair stations three or more times. Blades are shaped with a backing fulcrum below and hydraulic press above, or with copper or rawhide hammers. "Fine-tuning is best done by hand," Hale says. "We're measuring to three decimal points or better but using hammers" — which he admits seems a bit like surgery with a chain saw — "but an experienced technician can visualize the corrections needed and knows just how to hit the blade to move it a few thousandths of an inch." If that seems imprecise, results are unambiguous. Computer printouts show exactly how accurate repairs are, rather than relying on technicians' say-so.

For all the benefits of computer

measuring, it has a fault — in most cases only the face of the propeller is measured. Unequal blade spacing or uneven blade thickness can still cause vibration. Prop shops rely on static balancing — placing the propeller on a stand to ensure even

Analog pitch gauges measure blade height in two places to determine pitch.





Metal is sanded and abraded away by skilled hands as part of the effort to achieve a balanced prop (above). A cracked hub is one repair even high technology cannot make (below). A dynamic balance machine (below, right).

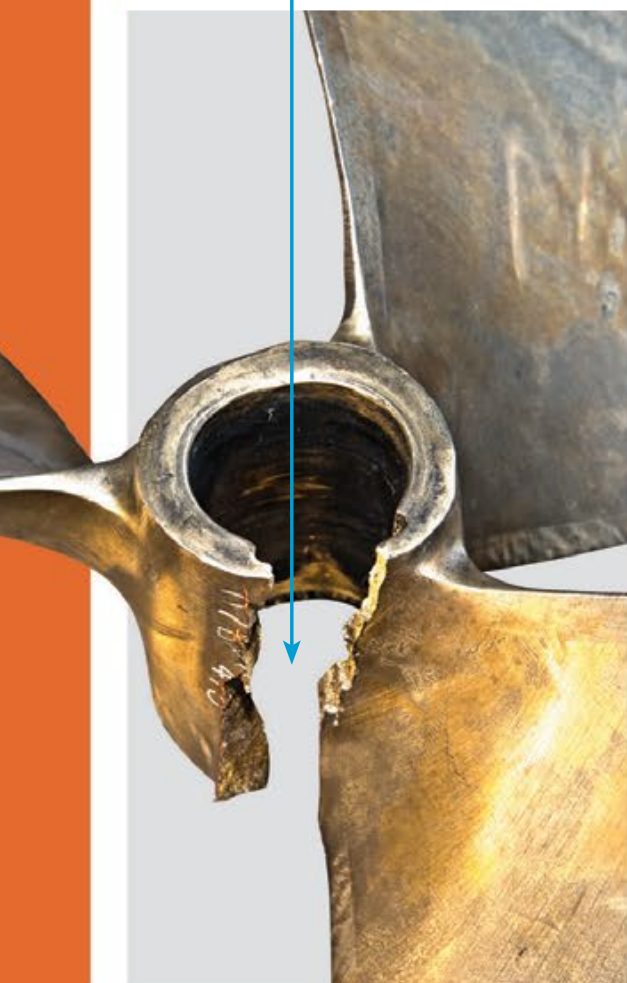
weight — as a final check. Usually for an upcharge, a dynamic balancing machine spins propellers and accelerometers measure wobble. The balancing machine shows where on the propeller to remove how many grams of weight, which techs polish away with sandpaper and a Scotch-Brite pad using a hand-held grinder.

“We’re measuring to three decimal points or better but using hammers, but an experienced technician can visualize the corrections needed and knows just how to hit the blade to move it a few thousandths of an inch.”

“A prop might measure within spec, but blade spacing could be slightly out,” Hale says, which will leave it out of balance. On the other hand, “a propeller that balances perfectly can be out of track or out of pitch and still shake.” When pressed, both Hale and Harrison stress the computer as more important than balancing to prop repair.

PROPS AND DRIVES

Outboard and sterndrive props run behind the boat, not beneath it, and they’re



isolated by machinery designed to absorb some vibration, so they benefit less from computer-aided repair. The ones that might benefit more, those with complex geometry designed into the blades, are typically repaired on proprietary pitch blocks with that geometry built in — and using those pitch blocks can be crucial. “If we flatten out one subtle curve, a boat might lose 5 or 10 mph,” Harrison says, particularly of very fast outboard-powered bass boats and flats skiffs.

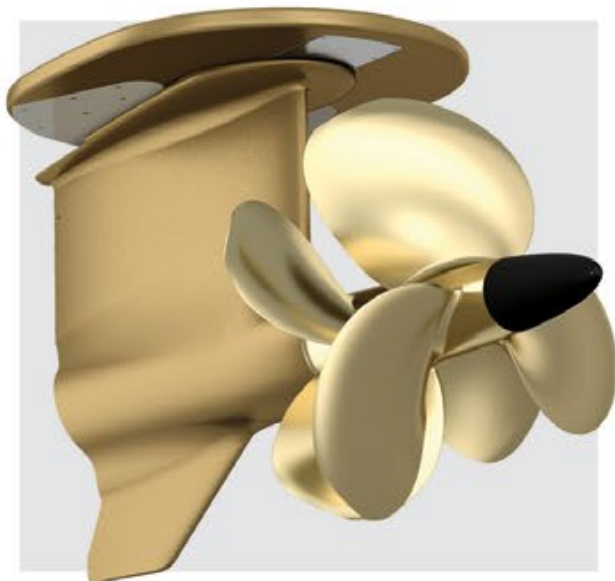
Racing boats are another story. Computer measuring, along with patterning each blade to ensure exact shape, and matching critical blade thicknesses — termed lab finishing — do increase performance. Compare Harrison’s charge of \$125 for a traditional

ensure a weld goes all the way to the bottom of a crack. Beyond that, the decision to repair comes down to money — Hale’s threshold is half of replacement cost — and also time. “A new inboard prop takes five to 10 weeks to make and ship,” Hale says. “In a short boating season there’s a lot riding on every weekend, so repair might make more sense.” On the other hand, an aluminum outboard prop needing both repair and a new hub can be quicker and cheaper to replace than fix.

So what’s the takeaway? When it comes to prop repair, you get what you pay for — more money should result in less vibration and maybe better performance. Is it worth the dollars? That depends a lot on each boat, and probably more on each boat owner. ⚙️

QUICK TIP

Harrison says vibration that steadily increases along with rpm is likely caused by a propeller or a bend in the last few inches of the prop shaft, but vibration that levels out or even lessens at faster speeds is usually caused by misaligned engines or a bow in the middle of the shaft.



Mercury Mirage prop repair with \$425 to lab-finish the same prop, though. “To do that for two, three or four engines, that’s a lot of money for a few miles per hour.”

Pod-drive props incorporate complex geometry into a pair of contra-rotating propellers. “We really have to use computer measuring to repair them.” And unlike on straight inboard props, on which repair inaccuracy tends to cause vibration but not affect performance, misshapen pod props can impact speed.

FOULED UP BEYOND REPAIR?

When props strike a rock, one blade can twist closer to the adjacent blade. To fix this, hubs are heated and blades are pulled back in shape with a gloved hand. Technicians close cracks near blade tips and replace missing chunks by welding in new metal. Cavitation burns are filled by welding. Cracks near the hub typically can’t be fixed, since it’s impossible to



These blades change shape outward from the hub and across each blade radius.

Going the

A watercolor-style illustration depicting a man with a determined, almost pained expression, wearing a blue shirt and red pants, leaning forward in a red speedboat. The boat is moving rapidly across a blue body of water, leaving a white wake. In the background, the Statue of Liberty stands on a rocky island. The overall style is artistic and dynamic, with visible brushstrokes and a vibrant color palette.

When most performance-boat enthusiasts hear that a new Skater catamaran or V-bottom is being built by Douglas Marine, the first question they ask is “how fast will it run?”

It’s an expected question. Skaters are some of the fastest boats in the world. But in the case of a new one being built for a different purpose, the question is “how *far* will it run?”



Distance

Is 100 mph at 2 mpg possible?

STORY BY ERIC COLBY ILLUSTRATION BY TIM BOWER

Tyson Garvin and Chris Fertig, who set the record for *Boating's* Bermuda Challenge in a Skater 399 V-bottom, are building a Skater 50-foot catamaran so they can chase more endurance records, including, they hope, a circumnavigation record.

"The reason we're building this boat is to make long-distance runs," Garvin deadpans. "There's nothing out there that goes very fast at all that can go a long distance." Let's take a closer look at this design.



[1]

THE BOAT

This purpose-built 50-footer is beefed up from construction to a serious JL Audio stereo system because, as Garvin puts it, "Music is a nice distraction. We might run this thing for

a month straight."

Douglas Marine President Peter Hledin says the hull is brand-new. For starters, the boat's deck is

Garvin and Fertig will ride in Shockwave SWP-1035 suspension seats that have 8-inch total travel, so they will still have unobstructed

pounds of fiberglass and carbon fiber in the boat. "That's why we went with Pete," Garvin says.

GARVIN ESTIMATED THAT THERE'S AN EXTRA 1,000 POUNDS OF FIBERGLASS AND CARBON FIBER IN THE BOAT. "THAT'S WHY WE WENT WITH PETE," GARVIN SAID. "HE'S BUILT BOATS FOR SO LONG THAT HE KNOWS WHAT WORKS."

6 to 8 inches taller than a standard model's, and the windshield adds another 6 inches for an overall height that's a foot taller.

sight lines. The seat is designed for military use, and Garvin and Fertig have the first generation.

Most of the design tweaks made to the boat are to improve rough-water durability and handling. The bow of each sponson is taller than on a standard Skater so the boat won't stuff into waves as easily. "We told Pete we wanted it to be taller to handle bigger waves," Garvin says. They also told him to build it strong with additional bracing throughout the boat. Garvin estimated that there's an extra 1,000

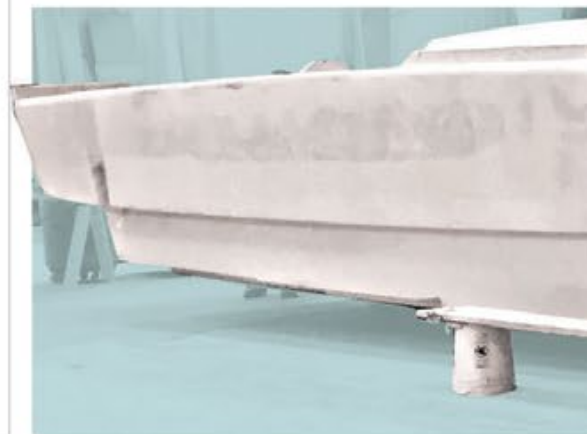
"He's built boats for so long that he knows what works." As with any Skater, the boat's laminate is vacuum-bagged with epoxy resin and BALTEK balsa coring. This process evenly distributes the resin through the laminate, preventing puddling and ensuring the best bond between materials.

In case the boat does stuff a wave, the deck



[2]

[1] JL Audio will provide the sound system. [2] Shockwave SWP-1035 suspension seats [3] Wagler Competition will marinize and modify GM Duramax diesels.



PHOTOS: (FROM TOP) COURTESY DOUGLAS MARINE; COURTESY JL AUDIO; COURTESY SHOCKWAVE SEATS



hatches are positioned farther aft, where they are less likely to be submerged. To rid the cockpit of unwanted water quickly, they'll install 4-inch-diameter drains like you'd find in a sport-fishing boat. Finally, if the boat hits flotsam that compromises the structure, inflatable bladders will deploy to keep the boat afloat.

Skaters run as fast as they do because they are efficient. Garvin and Fertig hope to leverage that efficiency to carry all the weight that's going to come with the boat's expansive fuel capacity and all the safety gear the team will have on board. The tunnel between the sponsons is wider and the sides are steeper, all in the name of packing more air into the tunnel. "At 120 or 130, we're not going to blow over backward," Garvin says.

The boat's fuel capacity is 1,400 gallons in two 500-gallon main tanks and a pair of 200-gallon tanks

forward. The boat will not have trim tabs. Instead, Garvin, who throttles for the team while Fertig drives, will transfer fuel fore and aft to affect trim.

THE ENGINES

Garvin and Fertig's goal is to run 100 mph while achieving a burn rate of 2 mpg. Power is going to come from a pair of marinized GMC Duramax

(waglercompetition.com) in Odon, Indiana, which is best known for its high-output diesel engines that power mud-racing trucks and pulling trucks. The engines will produce about 1,200 hp and 2,000 foot-pounds of torque and will be equipped with twin turbochargers, one 88 mm unit and one 102 mm compressor. Internal components will include Winberg crankshafts and R&R connecting rods;



diesels punched out from their original 6.6-liter displacement to about 7.0 or 7.1, says engine builder Jeremy Wagler, owner of Wagler Competition

pistons will come from either Wiseco or Mahle, and there will be a total of four engines built, two for testing and two for the boat. Garvin was still undecided

WHY A CATAMARAN? THE CAT'S MEOW

Some people might wonder why Garvin and Fertig would choose a catamaran instead of a V-bottom for setting endurance records. John Cosker, president of Mystic Powerboats, which builds some of the fastest and most successful offshore catamarans in the world, gives us five high points for cats when it comes to trying to set endurance records. Cosker says that a catamaran would be ideal for inshore records such as Tampa, Florida, to Miami; around Long Island; Chicago to Detroit; or even Miami to New York. Why?

- **Higher speeds with the same power, which results in better efficiency**
- **Better seakeeping up to about 6- to 8-foot seas (In taller seas, I don't care what design you're in — hang on.)**
- **More stability to run consistently at higher speeds**
- **Long-distance cruising speed of 150 mph attainable with the right power plants**
- **Safer in the cockpit running at high speeds with the high windshield and deck lines — E.C.**





about propellers for the boat, but with the engines' projected maximum rpm range of about 4,000, he says he could use Mercury Racing wheels. Garvin's own company, Apex Manufacturing and Design, can also make its own props.

THE EQUIPMENT

Because the duo might be running without support vessels or aircraft, the boat's windshield is a custom piece constructed out of bulletproof, laminated acrylic at Lee Aerospace in Wichita, Kansas. Owner Jim Lee owns a Skater 46, *Freedom*

This windshield also incorporates a special gold coating that can be heated

supply is never interrupted during the long-distance record attempt. To keep the

**THE ENGINES WILL PRODUCE
ABOUT 1,200 HP AND 2,000
FOOT-POUNDS OF TORQUE AND
WILL BE EQUIPPED WITH TWIN
TURBOCHARGERS.**

and would mitigate icing while running in cold climates. That windshield de-icing feature could prove most useful for a boat that might be attempting to set records while plying the Southern Ocean or navigating the Northwest Passage.

In addition to the suspension seats and extra fuel capacity, the 50-foot catamaran will have streaming video capability, designed by a company named Digigone, so that fans can watch the team during the record attempt. FloScan is sponsoring the team with its FloNET fuel-flow metering systems so the racers can get the most range out of the boat. Racor is another sponsor, providing duplex fuel filters to ensure the engine fuel

boat on course, Simrad is providing one MO19-T, two MO16-T and two NSS12

- [1] Racor duplex fuel filters
- [2] FloScan fuel-monitoring display
- [3] FloScan FloNET hub, which interfaces with NMEA 2000 network devices
- [4] FloScan FloNET sensor system
- [5] Arneson ASD8 surface drives are efficient and durable.
- [6] Simrad electronics were chosen for communication and navigation.
- [7] Digigone will stream live video.

monitors plus a cutting-edge integrated navigation system that will include 4G radar, GPS, AIS and communications equipment including VHF radios, plus all supporting components. Engine instrumentation will be integrated into the Simrad system. Last but not least, for a little wow factor, when the boat pulls up to a dock Garvin can hit a button and fenders will pop out and inflate.

If you happen to be at a destination when he and Fertig arrive, don't ask the typical question. Be original and ask, "Hey, how far can it go?" 📶



[1]

US1, which he takes to poker runs around the country, and he's a former offshore racer, so he knows how important a strong windshield is to the structural integrity and safety of a performance boat like this new Skater.



PHOTOS: COURTESY DOUGLAS MARINE (TOP AND BOTTOM), COURTESY PARKER HANNIFIN CORP. (RACOR FILTERS)



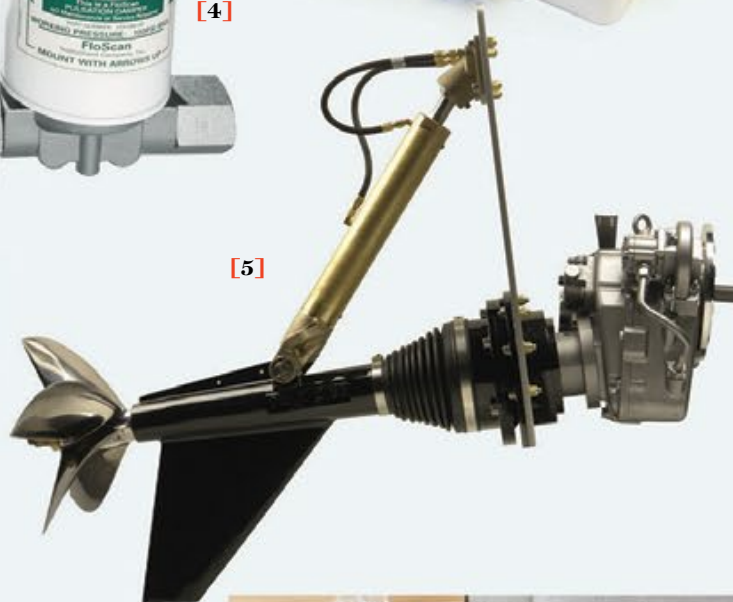
[2]



[3]



[4]



[5]



[6]



[7]



NOTABLE POWERBOAT DISTANCE RECORDS

>HEARTLAND EXPRESS
Minneapolis to New Orleans
50:21:00

Michael Ward
James Boonstra
Terry Stephenitch
Baretta Phaser 230, Mercury

>ASSAULT THE INSIDE PASSAGE
Ketchikan, Alaska, to Seattle
11:42:50

Kurt Willows
Skater, Mercury

>BERMUDA CHALLENGE
New York to Bermuda
15:48:00

Chris Fertig and Tyson Garvin
Skater 399, Cummins/Arneson

>TRANS-ATLANTIC
New York to England
62:07:47

Tom Gentry
Vospers, MTU Turbine

Electronics



By syncing the Polk PA4A Ultramarine source unit and your mobile device, you have the ultimate wireless remote for accessing functions of the audio system and listening to your playlists wirelessly through the system. The Ultramarine app is available for both iOS and Android devices.

The 200-watt PA4A includes a stylish, compact and waterproof audio control/display for the helm in case you forget your phone. A waterproof, hideaway module is designed for installation behind the helm. Add a USB port for MP3 storage. Hardwired remotes can be added to the transom or second station.

In addition to Bluetooth connectivity, the PA4A is Sirius XM-ready and includes NOAA weather band to keep boat-ers informed of approaching weather. It also has an AM/FM tuner that allows you to select stations by content type and automatically add to favorites. The PA4A connects with up to four speakers, but you can also add an amp for a subwoofer and even more speakers. The PA4A also allows

Polk Ultramarine Audio System with App Control

Wireless remote controls for boat stereos have been around for years, but now Polk Marine Audio, a brand from ASA Electronics, takes stereo remotes to the next level, allowing you to control the functions of your marine audio system and play music from your library wirelessly, using an app on your Bluetooth-enabled mobile device. — Jim Hendricks

Apps Afloat

With the incalculable number of boating apps, your mobile phone becomes increasingly valuable on board, which is a problem if it's still vulnerable to water damage.

Of course, you can shield your phone from spray or an incidental dunking in the livewell with a protector such as a LifeProof Frē waterproof case (\$79.99 for an iPhone 5; lifeproof.com).

These are great for boaters, yet even with a case, your phone won't float; if you drop it overboard in deep water, you're incommunicado.

To the rescue is the LifeProof LifeJacket (\$39.99 for an iPhone 5 case). Molded from closed-cell foam, it fits snugly around the company's waterproof case. The bright distress-orange color makes it easy to find if your phone goes in the drink.

Like many real life jackets, the case adds bulk, so it can be difficult to stuff in your pocket, but it comes with lanyards — one for your neck and one for your wrist. I like to wear mine around my neck, tucking it under the jacket to keep it from whipping about in rough water. — J.H.



PHOTOS: (FROM TOP) COURTESY POLK AUDIO, JIM HENDRICKS; (OPPOSITE, FROM LEFT) COURTESY POLK AUDIO, CRAIG HASHIMOTO, JIM HENDRICKS



for iPod, iPhone or iPad control and charging via a plug-and-play connection.

A nonvolatile memory guarantees that your user preferences will be saved if power is disconnected from the system. Plus, an audible warning tells you if your boat batteries are low.

You can download the Ultramarine app for free at the App Store or Google Play. The manufacturer's suggested retail price for Polk's PA4A (excluding speakers or amp) is \$499. For more, visit asaelectronics.com.

Ask Ken



Q How can I connect a smartphone or tablet to my boat stereo so I can play my music library on board?

A A number of stereo decks, particularly older models, do not have a front-panel jack to connect a mobile device to, such as an iPhone, iPad or Android tablet or smartphone to play a stored music list. Since the front panels of most stereos are of the same dimensions, you might want to consider upgrading to a new set. Alternatively, you can install a bulkhead-mount audio port such as the Jensen Marine jPort (shown right, \$12.99, motosport.com), which has a 9-foot cord to connect to the auxiliary input jacks

found on the rear panel of most stereos. This will allow easy plug-in connection for any Apple or Android mobile device.

Jensen also lets you connect a portable audio device to its marine audio 3.5 mm mini-pin/USB combo port (\$39.99, jensenmarinedirect.com). This dash-mounted, dual-port jack comes with a 24-inch cable that mates with the auxiliary connectors on the back of a marine stereo. — Ken Englert

ASK KEN ONLINE

For more exclusive electronics content, visit boatingmag.com/askken.



StarGazer Wake Edition GPS Speed Control

The Wake Edition can be installed on most wakeboard, ski and stern drive boats. Ideal for riding, surfing, skiing and even tubing! Let PerfectPass take the stress out of driving...simply pre set the speed and go!

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- Enhanced performance for all wakeboard & stern drive boats
- No calibration ever required



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Short Casts

Seven Safety Tips for Anglers

I once had a 6/0 Siwash that was attached to an 8-ounce jig embedded in my back by a fellow angler who didn't watch his backcast. And in nearly five decades (OMG!) of chasing fish, I've seen numerous other injuries from minor to major. Boating Safety Week occurs in May, but I'm asking that we practice fishing safety too. Here are some tips to get started. — Kevin Falvey

Pull Aside

A hook can end up in an angler's flesh while boating a fish, removing the hook and even while rigging up. Grab the hook by its bend and pull in line to tighten the knot, and you might impale yourself if your grip slips. So, when pulling tight on a knot, place the hook over a post,



reel lug or other sturdy structure. Alternatively, hold the hook at 90 degrees to the line and pull.

Covered Up

Literally meat hooks, gaffs can impale anglers or bystanding crew. Hold gaffs vertically as the fish

to be gaffed draws near — holding a gaff horizontally aboard a boat should be avoided. Also, take care if looking over the gaff man's shoulder in order to get that Facebook shot. More than one fishing photographer has received a black eye for his efforts when the butt of the gaff handle struck him on the upstroke. Finally, while the gaff is stored in the rack, or rocket launcher, cover the tip with a cork, some surgical tubing or a tennis ball.

Aloe, are you there?

The image of the lobster-red fisherman straight-arming his catch for the camera is so common to

have become a cliché. Distracted by rigging, baiting, casting, reanchoring, netting and more (that's fishing, man!), anglers can forget to protect themselves from the sun's damaging rays. So always apply a high-SPF sunscreen, and wear protective clothing, like these Simms SolarFlex guide gloves (simmsfishing.com, \$50), even on



those cloudy days that always seem to be great for catching the big ones.

Slice Nice

Responsible use and care of knives is paramount for safety. There are two primary rules for knife

safety. One is that a sharp blade is safer than a dull one because, since a sharp knife doesn't catch or slow down, the user is not tempted to force a cut. This is especially important aboard a rocking boat. Also, knives not in use should be sheathed. Don't have a sheath? Fold cardboard and secure it closed with duct tape.

Finger Tip

Superbraid lines offer many advantages, but they can cut your finger right to the bone. This happens, while casting, when you apply more pounds of pressure to the

line than the amount of resistance the reel's drag is set to. This causes the braid to slip on the spool and cut into your finger. To prevent this you can tighten the reel drag, cast softer, or use finger protection. There's a host of fishing finger guards



available for sale, but I use waterproof athletic tape more often than not.

In closing, let's remember that safety is something that occurs between our ears.

Like these tips? Add your own tips at boatingmag.com/fishingsafety.

A STEP TOWARD SAFER FISHING

Feet can prove vulnerable to injury aboard a fishing boat. Granted, sandals are all the rage and I, personally, like going barefoot aboard my own boat. But when actively engaged in a bite, I turn into Capt. Bligh and demand all anglers be shod in closed-toe footwear. Decked fish can bite you, impale you with their fins, barbels or tail spikes, and throw a hook or lure with enough force to embed it into your ankle. Oh, yeah, the corollary to this tip is: "Never step on landed fish to unhook them." Fish slime will defeat the grip of even the best boat shoes and nonskid, creating the potential for a slip and fall. — K.F.

Seeing Is Believing

See around your boat in real time with Garmin Panoptix sonar. Its screen refreshes continuously, and the Panoptix transducer delivers three modes: LiveVü Down, RealVü 3D Historical and RealVü Down. \$1,499.99; garmin.com — K.F.



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BY RANDY VANCE



When Things Go Badly Wrong

WE CAN'T TEST ALL PERSONAL LOCATOR BEACONS, BUT HERE ARE SOME OPTIONS WITH VARIOUS SERVICE CAPABILITIES.

Personal locator beacons (PLBs) save lives. By comparison with the cost of unguided search-and-rescue efforts, their cost is inconsequential. I could make an argument that it is just plain irresponsible to head offshore without one, and it would be a fair argument. EPIRBs, vessel-dedicated emergency position-indicating radio beacons, are required on commercial boats for these reasons. The U.S. Coast Guard would like you to consider

at least carrying one PLB on your recreational outing.

At one time, personal locator beacons served only to send a one-way message via satellite to rescue personnel. The wait for rescue is always painful, but more so when you don't know if anybody knows you need it if an emergency occurs out of range of a VHF radio or mobile phone.

Even so, in the past, the cost of \$300 PLBs has been a key factor in resisting their purchase.

Today, however, the benefits of PLBs have risen astronomically because they can also use satellites for other communications, such as texts, family tracking and, for some devices, the ability to summon nonemergency towing assistance. Some can even receive a message, such as "help is on the way" or "help will be there in one hour." With all these benefits, there is no good reason to leave one of these devices out of your gear bag. And now, costs are even lower, making the

security they provide above that of normal VHF communications very valuable.

We haven't tested every PLB, by far, and in truth you can't really test any SOS device — that's illegal. We have analyzed their features, benefits and costs here in this tight, concise run-down. And in the case of those with the capability of sending civilian messages via their satellite network, we also tested that. We even noted the time it took for each one to communicate.

HOW WE TESTED

Efficient connection to appropriate satellite constellations is key to timely rescue and a function of comprehensive satellite coverage plus the efficacy of GPS receivers. We cold-started each device and immediately initiated a test message to see how long it took to link to its satellite constellation and receive the message via Gmail. We assume that this process should approximate the time needed to send and receive an SOS.

ILLUSTRATION: COURTESY U.S. COAST GUARD

The Daniel Steiger

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ACR ResQLink+

\$250; ACRARTEX.COM



The one-way standard for emergency personal locator beacons, this product has launched many rescues initiated by someone activating the device. It communicates with high-orbit satellites, transmitting the distress signal. Without a GPS on board, general rescue locale is determined mathematically by the satellites and reported directly to government rescue operators. Once they're in the vicinity, the PLB is tracked by its locator beacon for final position and rescue.

SELF-TEST: Receive an email and/or SMS text message confirming receipt of your beacon self-test using the optional subscription service at 406link.com.

RESCUE NETWORKS: Cospas-Sarsat, FCC, Canada, R&TTE, Australia, New Zealand

COVERAGE: Worldwide

COOL BECAUSE: The self-test function lets you know the PLB is hooked up and running. A rescue strobe aids night location during rescue. Also, it connects directly to international Cospas-Sarsat rescue authorities.

PROS: It gave the fastest "OK" transmit time in our test and offers free replacement if it saves your bacon. Communications subscription at 406link.com also gives low battery notification.

CONS: It's able to send only one preprogrammed message.

BESTS: Communicates with oldest, most prestigious emergency rescue response teams in the world

GPS: 66 channels

BUOYANT: Yes

WATERPROOF: 16.4 feet/floats

WEIGHT: 5.4 ounces

BATTERY TYPE: Nonhazmat lithium

BATTERY LIFE: 30 hours

WARRANTY: Five years

RESCUE COMMUNICATIONS: Cospas-Sarsat

ACTIVATION PROCESS: Register at beaconregistration.noaa.gov/rgdb. Subscribe to communications services at 406link.com.

ACTIVATION COST/YEAR: Cospas-Sarsat free; 406link.com from \$40 annually for confirmation emails, SMS and low-battery notice

TIME FOR SATELLITE CONNECTION: One minute

DeLorme inReach Explorer

\$380; INREACHDELORME.COM



This device is essentially a handheld GPS, PLB and two-way satellite communicator all rolled into one. Save and store waypoints and navigate back to them while tracking progress on a color-coded map. An internal digital compass, barometric altimeter and accelerometer improve utility. Connect iOS or Android devices loaded with the free DeLorme Earthmate app via Bluetooth, and you can download maps, track your progress on the Web, and create and manage routes and navigate to them. The device becomes an operating partner with inReach.

SELF-TEST: You can send and receive text messages worldwide using the Inmarsat system. Send 160-character text messages to five established contacts. Link it with the Earthmate (iOS or Android) app to easily send, receive and share your position.

RESCUE NETWORKS: The international GEOS rescue coordination center receives SOS 24/7 and arranges local rescue assets.

COVERAGE: Worldwide

COOL BECAUSE: With the inReach service you can plan trips, routes and messaging online and execute them with the device. Pelagic anglers use the device in partnership with ROFFS sea temperature service to update custom fishing plans.

PROS: Two-way communications are fun and reassuring.

CONS: The small screen makes navigation awkward.

BESTS: Most versatile adventure tool

GPS: 32 channels

BUOYANT: No, but a floating sleeve is available.

WATERPROOF: 3.3 feet

WEIGHT: 6.7 ounces

BATTERY TYPE: Lithium

BATTERY LIFE: 100 hours

WARRANTY: One year

RESCUE COMMUNICATIONS: Iridium satellite network, two-way information

ACTIVATION PROCESS: Register online, select communications service, and designate contacts.

ACTIVATION COST/YEAR: From \$144 (from \$12 monthly)

TIME FOR SATELLITE CONNECTION: Eight minutes (one minute for a reply)

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Spot Gen3

\$150; FINDMESPOT.COM



Spot was the first to use the Globalstar constellation for PLB functions combined with communications. Using Globalstar, the Gen3 can send messages you preprogram online before departure and send them via SMS or email to recipients you specify plus Twitter or Facebook accounts. Running late? The Gen3 offers improved tracking and allows friends to view it online.

SELF-TEST: LEDs indicate satellite coverage and GPS hookup. LEDs confirm when a message is sent, whether it's an "OK" prearranged text message or an SOS.

RESCUE NETWORKS: The Spot Gen3 uses the international GEOS rescue coordination center to receive SOS notifications 24/7 and arrange for local rescue assets to arrive at the GPS location transmitted with each SOS ping.

COVERAGE: Worldwide

COOL BECAUSE: A messaging button connects to nonemergency services like predesignated towing services, should your emergency be non-life-threatening. It will send your position to predesignated recipients and allow them to track your trip online. There's a direct USB power cord for when power is available.

PROS: Its inexpensive purchase price and low-cost communications service provide more everyday value plus emergency rescue.

CONS: There's no message feedback to acknowledge receipt of signal or estimated time of arrival for rescue.

BESTS: Best rescue plus communications device value

GPS: 16 channels

BUOYANT: No

WATERPROOF: Water-resistant IPX-7

WEIGHT: Four ounces

BATTERY TYPE: Four lithium or rechargeable AAAs

BATTERY LIFE: 80 hours of SOS

WARRANTY: One year

RESCUE COMMUNICATIONS: Globalstar satellite network, one-way information

ACTIVATION PROCESS: Register online, select communications service, and designate contacts.

ACTIVATION COST/YEAR: \$10 monthly to \$150 per year for unlimited messaging

TIME FOR SATELLITE CONNECTION: 10 minutes

Spot Global Phone

\$500; FINDMESPOT.COM



Dial this light, water-resistant satellite phone just like a mobile phone to reach out and touch someone. As with all of these devices, you'll need clear access to the sky to reach the Globalstar satellite constellation. A color LED screen gives access to contacts and other functions. Directly dialing 911 makes emergency calls easy. A handheld GPS is needed to provide rescue coordinates.

SELF-TEST: A satellite phone is its own self-test, thanks to the immediate feedback from two-way communications.

RESCUE NETWORKS: The Global Phone's 911 call function automatically connects to the GEOS rescue coordination center to communicate and arrange for local rescue personnel.

COVERAGE: Worldwide

COOL BECAUSE: Self-testing is redundant on satphones — you speak directly with the 24/7 GEOS service, which arranges rescue and updates you on progress. The phone allows more detailed communications, which is often helpful in transmitting advice for first aid and personal calls to notify or reassure associates. It can also be used to transfer email online.

PROS: Two-way emergency communication is reassuring and allows access to first aid instruction. This device was as clear as a land line in our test calls.

CONS: Location information must be manually provided; change in position due to drift or other activity is not automatic.

BESTS: Best and lowest cost communications device

GPS: None

BUOYANT: No

WATERPROOF: No

WEIGHT: 7.1 ounces

BATTERY TYPE: Lithium

BATTERY LIFE: Four hours talk/36 hours standby

WARRANTY: One year

RESCUE COMMUNICATIONS: Globalstar satellite network, two-way information

ACTIVATION PROCESS: Activate online.

ACTIVATION COST/YEAR: \$25 monthly to \$1,800 per year for unlimited minutes

TIME FOR SATELLITE CONNECTION: Four minutes

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Breitling Emergency

Among mariners, the argument against buying and using a PLB is, well, that you don't really use it at all. Only if the ship goes to hell in a handbasket is everybody really grateful to have one. Otherwise, most crew may not even know it's onboard — and too many too-casual skippers may forget to keep the device handy and maintained as well. The U.S. Coast Guard wants you to have a PLB, because using one could easily save enough money, skipping the tedious "search" exercise and going directly to the



rescue stage, to fund a small country — or at least to purchase this cool status symbol of a watch, with PLB. Clearly multipurpose text-messaging beacons like those on the previous pages are just the first, and soon to be most modest, step in making emergency communications equipment desirable for everyday use.

Breitling's Emergency is the first luxury watch that also carries a dual-frequency PLB on board. It talks to Cospas-Sarsat in the case when the last thing between you and the sea is on your wrist. Certainly, in everyday life, nothing could make a more macho statement of means than a

rugged titanium case and bracelet, a sapphire crystal and the most well-equipped chronometer with SuperQuartz movement (10 times more accurate than standard quartz movement, says the Official Swiss Chronometer Testing Institute) — and it's all nonmagnetic so it won't skew the ship's compass, possibly making necessary its emergency deployment.

Yes, ladies and gentlemen, this dandy watch, so well-named "Emergency," also has an amazingly well-engineered PLB. It communicates at 406 MHz with the Cospas-Sarsat system to communicate your peril and general location just like the ACR PLB. It also emits a 121.5 MHz homing beacon to bring the rescue team in for the final few hundred feet. In rough seas, that could mean saving precious minutes and life. An integrated antenna and an onboard battery will keep it in constant touch with the satellite system and rescue personnel for 18 hours.

For a Viking in the North Sea, Valhalla will come much sooner than that, so the 18-hour charge should be more than sufficient for his needs.

Certainly I want one, but at an expected price tag of \$15,825 when it's available at year's end (just in time for Christmas, ladies), media samples won't be available, I am told. This season, I'll be using one of those PLBs on the previous pages. Next season too, I think. — R.V.



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Your watch shouldn't cost more than your car. It should look and feel like a power tool and not a piece of bling. Wearing it shouldn't make you think twice about swinging a hammer or changing a tire. A real man's timepiece needs to be ready for anything. But that's just my opinion. If you agree, maybe you're ready for the **Stauer Centurion Hybrid**. Use your **Exclusive Insider Promotional Code** below and I'll send it to you today for **ONLY \$59**.

This watch doesn't do dainty. And neither do I. Call me old-fashioned, but I want my boots to be leather, my tires to be deep-tread monsters, and my steak thick and rare. Inspiration for a man's watch should come from things like fast cars, firefighters and power tools. And if you want to talk beauty, then let's discuss a 428 cubic inch V8.

Did I mention the \$59 price tag? This is a LOT of machine for not a lot of money. The **Stauer Centurion Hybrid** sports a heavy-duty alloy body, chromed and detailed with a rotating bezel that allows you to track direction. The luminous hour and minute hands mean you can keep working into the night. And the dual digital displays give this watch a hybrid ability. The LCD windows displays the time, day and date, includes a stopwatch function, and features a bright green electro-luminescent backlight. We previously offered the **Centurion** for \$199, but with the exclusive promotional code it's yours for **ONLY \$59!**

No matter what, this watch can keep up. Thanks to the Stauer 30-day Money Back Guarantee, you've got time to prove it. If you're not totally satisfied, return it for a full refund of the purchase price. You also get a 2-year replacement guarantee on both movements. But I have a feeling the only problem you'll have is deciding whether to keep the Stauer **Centurion** on your dresser or tucked inside your toolbox.



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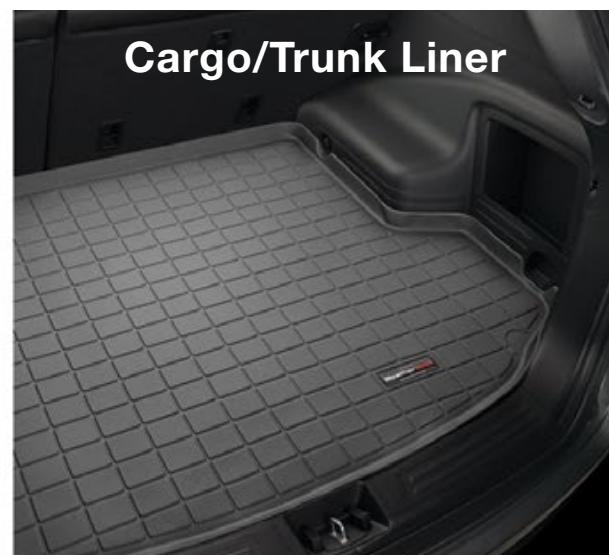
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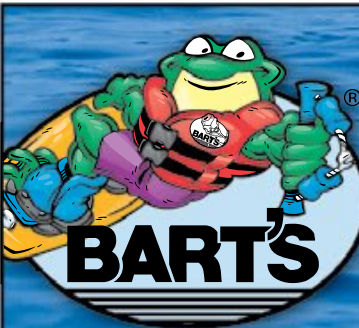



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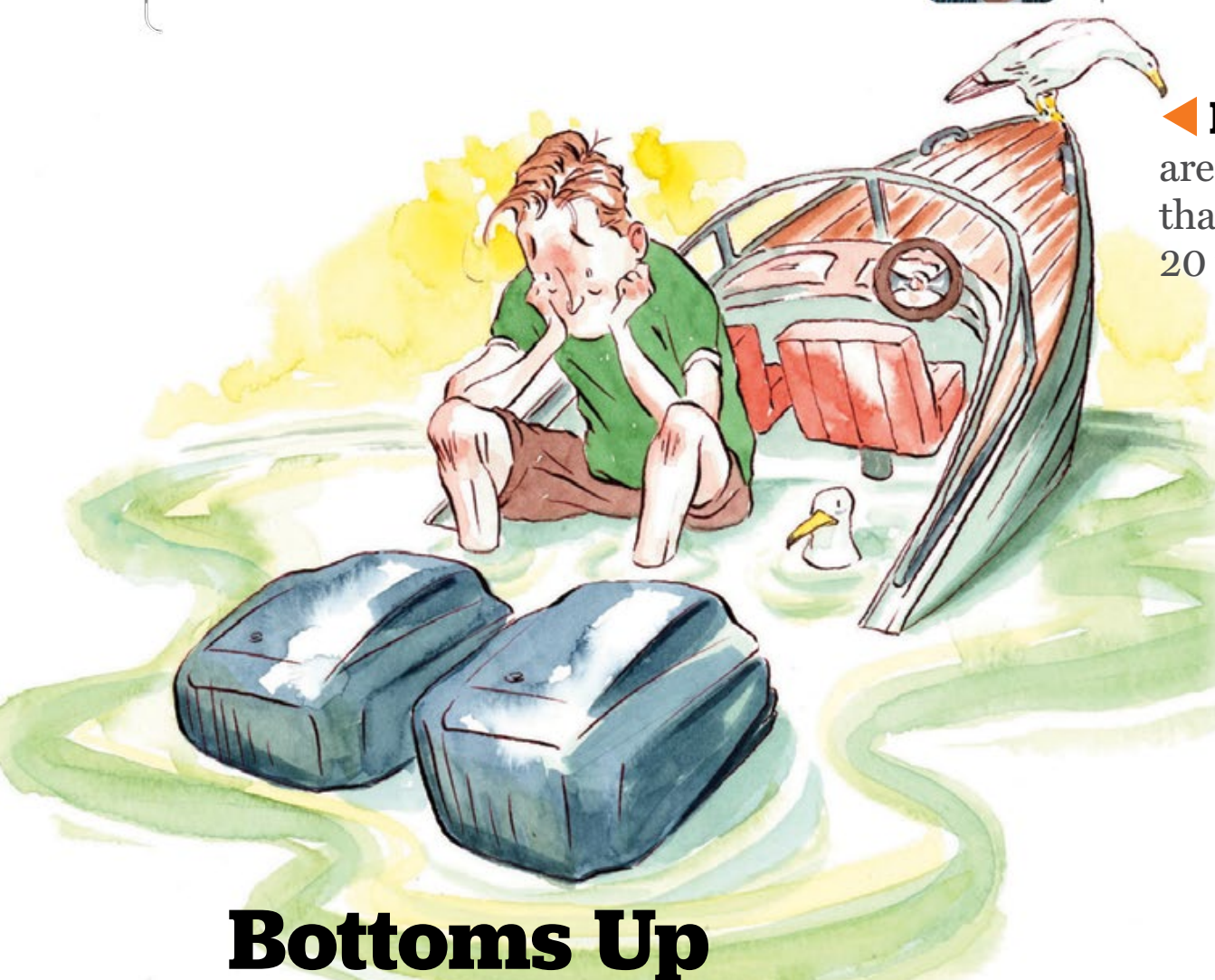
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Following Seas

By David Seidman



Bottoms Up

HOW OUTBOARDS ARE SINKING OUR BOATS.

ONLY ONE PERSON SAW IT GO UNDER, AND YOU COULDN'T have asked for a better witness. Don is an old-school dockmaster who knows how a boat should sit in the water. He knows the signs, but this one took him by surprise.

"It rained hard for three days," said a bewildered Don, "but the boat always looked fine. Then the weather cleared and a front came through with 30 mph winds. Around noon I noticed the boat listing. Then it rolled over, kind of in slow motion. Just like that."

The boat was hauled and the insurance company's surveyor showed up.

"Why'd it go down?" Don asked him.

"To start," said the surveyor, "the cockpit scuppers are overgrown with barnacles, which held onto leaves and debris that clogged the drains. This caused some rainwater to collect in the cockpit. Other rainwater made it into the bilge, and after a few days of pumping, the battery ran out of juice."

"So why'd it roll?" Don was now getting impatient.

"Because of this," he said of the bilge pump's through-hull. "The boat heeled from the wind. Water in the cockpit held it over long enough for seawater to come in through the downwind scupper, which held the boat over longer. Normally this won't happen, but the cockpit sole is unusually low. It should be at least 3 inches above water level when upright. This one's not even close; the builder probably wanted to have a deeper cockpit."

He explained that, with the boat held over, the pump's outlet was also put under. Water came in; the pump used what was left of the battery to stop the flow and then quit. Water poured in through the pump and collected on the low side of the bilge. When a strong gust hit the canvas top, over it went.

◀ **Bigger, bulkier outboards** are often being put on hulls that are revised designs from 20 years ago.

The bilge outlet hose didn't have a raised vented loop to help prevent this. But the main culprit was that the outlet was only an inch above the builder's taped waterline — which had been raised by 2 inches over the original waterline. Plus, the boat was sitting too far down in the stern. "I've seen a few cases like this, all caused by big outboards," said the surveyor.

Bigger, bulkier outboards are often being put on hulls that are revised designs from 20 years ago. It's become such a problem that the American Boat and Yacht Council (ABYC) revised the guideline for outboard weights on boats under 26 feet (Standard and Technical Information Reports for Small Craft, section S-30).

A few extra pounds on a boat weighing a few thousand may not seem like a big deal, but put them on a platform far astern of the transom with no buoyancy beneath them, and those pounds have a big effect. The boat that sank was rated for a maximum of 300 hp. A single 300 hp engine weighs about 560 pounds, but this boat had twin 150s at about 960 pounds. Don't think the extra 400 pounds were a problem?

Walk the docks. You'll be surprised at how many repainted (higher) waterlines you see. So how do you avoid buying a boat with a droopy butt? Check for known offenders at uscgboating.org/content/recalls.php. I still prefer a single engine to the "safety" of twins; reliability isn't the issue it used to be. Two engines also cost more, and the additional drag reduces efficiency.

So when I see you outside the inlet, keep your weight down and your stern up.

ILLUSTRATION: TIM BOWER



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